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Original Articles.

OBSERVATIONS ON THE USE OF THE DUODENAL TUBE FOR DIAGNOSIS AND TREATMENT.*

By FRANKLIN W. WHITE, M.D., BOSTON,

Instructor in Medicine, Harvard University; Visiting Physician, Boston City Hospital.

The duodenal tube for adults was introduced by Einhorn and by Gross about five years ago. A much simpler tube for infants was used by Hess a year or two later.

My own use of the tube, which is limited to adults, was begun about two years ago in a rather skeptical spirit, fearing that the instrument was little more than a toy; that its use might be disagreeable to the patient and the results of doubtful value. I was encouraged, however, by finding that men of good judgment in different parts of the country were beginning to use it, and my own experience has convinced me of its value both for diagnosis and treatment.

It is a real contribution to medicine and deserves far greater use than is being made of it now. The field for its use, both in diagnosis and treatment, is somewhat limited, but it has great value in that field.

The tube was used in 90 cases: in 56 for diagnosis, in 34 for treatment. In this paper we wish simply to emphasize a few of the newer and more important points under three headings.

* Read at the thirtieth annual meeting of the Association of American Physicians, Washington, D. C., May 11, 1915.

First, the introduction of the tube, with a study of the factors which help or hinder its passage through the esophagus and stomach.

Second, the use of the tube in diagnosis.

Third, its use in treatment.

THE INTRODUCTION OF THE TUBE.

In infants, the introduction of the tube as described by Hess is a very simple and easy matter. The tube consists merely of a No. 14 or 15 French Nelaton urethral catheter which is not too flexible. Its introduction, which was recently demonstrated to me by Dr. W. W. Howell at the Infants' Hospital in Boston, consists simply in laying the baby on its back on a table and gently but steadily pushing the tube down the esophagus, through the stomach and into the duodenum in two or three minutes. This prompt and easy passage is made possible by the short, horn-shaped baby's stomach, with its small cavity and relative lack of tone at the pylorus. A simple catheter of this kind, unfortunately, cannot be used in the adult, in whom the stomach is large, and the tube wanders far from the pyloric opening. Harmer and Dodd have shown that such a simple catheter or tube in the adult stomach tends to stick to the wall, form loops and curl up.

The introduction of the duodenal tube in the adult stomach is a mild procedure, however, made easy by giving the patient a quarter grain of codeia an hour beforehand and the use of a throat spray of novocaine. Sometimes a few sips of water have been given at the time of swallowing it, but this is unnecessary. A common way of introducing the tube has been to let

the patient swallow it in the evening, lie down on the right side and trust the tip of the tube to find its way into the duodenum over night. This method has largely limited the use of the duodenal tube to patients in a hospital.

Following suggestions from Holzknecht's laboratory, a systematic study was made with the fluoroscope to determine the factors which help or hinder the passage of the tube through the stomach and esophagus in the hope of developing a rapid technic of introduction which could be used with office patients or out-patients of a hospital.

We are greatly indebted to Dr. Walter J. Dodd of Boston, for help and suggestions in the x-ray work.

The passage of the tube through the esophagus is a simple matter started by the swallowing mechanism and then largely helped by gravity in the erect position. It takes place more slowly in the horizontal position by peristalsis alone. The passage of the tip past the larynx is slightly uncomfortable and may make the patient gag. A stylet may be used to push the tip quickly past the larynx into the esophagus, but it is rarely needed. A spasm of the esophagus may, of course, delay the tube: it has not occurred in this series of cases.

In the stomach the factors are more complex. We have studied the effect of gravity, of peristalsis, of the presence of food, of the rate of feeding in the tube, of the shape of the stomach and of spasm, or obstruction at the pylorus. Gravity was found to have the most important effect; in passing the tube rapidly through the stomach, the lesser curvature forms a sloping curve along which the tip of the tube rapidly passes toward the antrum and pylorus, with an empty stomach and the patient in the erect position. If the erect position is continued and the tube steadily swallowed, the tip gravitates to the bottom of the stomach usually in the region of the antrum, and tends to remain there for a time and form a coil in this vicinity. It is possible, however, by putting the patient in different postures and carefully feeding in the tube to swing the tip to right or left or forwards, or back within the stomach and thus guide it in the desired direction.

The postures used were as follows:

The tube was usually swallowed with the patient erect, which carried the tip vertically down the esophagus to the cardia (about 40 cm.) and half way down the stomach (about 50 cm.).

For the second position the patient leans forward, slowly lies down on the abdomen and turns on the right side. This carries the tip forward in the stomach and to the right over the high ridge of the spine, and places it in the antrum near the pylorus (tube in 60 to 65 cm.). These postures have been used by Dr. Walter J. Dodd of Boston, and other radiologists for rapid filling of the first portion of the duodenum with a bismuth meal in horizontal fluoroscopy. They are

essentially the same as those used by Holzknecht in passing the duodenal tube.

For the third position the patient turns partly or wholly on the back with pelvis raised by a pillow, to slide the tip up close to the pylorus and help it through, (tube in 70 to 80 cm.). This position also raises the hook-shaped stomachs, making them more transverse and easy to deal with, and the high ridge of the spine acts as a watershed and keeps the tip of the tube from dropping back into the left side of the stomach.

The use of a silk thread guide for the tip has been suggested to help its rapid passage into the duodenum. This means that the patient swallows about a yard and a half of twisted or braided silk thread the day before, which almost invariably finds its way into the duodenum. The capsule of the duodenal tube is then threaded down over this. While this silk guide is of great help in passing an instrument through a narrow place in the esophagus, it does not help the passage of the ordinary duodenal tube on account of kinking and friction, and, in fact, usually delays or prevents it.

Dr. Frank Smithies of Chicago has used a specially-made, long gum elastic French catheter with perforated tip which is passed rapidly into the duodenum over a string guide. The catheter is impregnated with metallic salts, is easily seen with the fluoroscope, and the position of the tip in the duodenum verified. He has found this a successful, rapid method of aspirating the duodenal contents. I have had no opportunity to use it through inability to get the French catheter.

The chief types of duodenal tube differ somewhat in their size and the weight of the tip, and vary also in the speed with which they can be passed through the stomach, largely on account of the action of gravity on the tips of different weight.

The Einhorn tube is small, with a No. 8 French tubing, with a long, oval, perforated tip of about 50 grains weight; the Gross tube is much larger with a soft No. 20 French tube and a large heavy tip of about 150-grains weight covered with rubber.

The Palefski tube is like that of Einhorn but has a heavier, shorter, oval tip weighing about 100 grains with only a few perforations. The heavier tips can be more readily placed close to the pylorus than the light ones by the action of gravity and the posture of the patient, and for this reason, the Gross tube and the Palefski tube, as a rule, enter the duodenum more rapidly than the Einhorn tube.

Each tube has its advantages. The Einhorn tube is small, easily swallowed, easy to retain, usually passes more slowly into the duodenum than the others, and occasionally plugs with mucus. We used it entirely for treatment and, frequently, for diagnosis.

The tube with the Palefski tip is likewise small, easy to swallow and retain, passes more

rapidly into the duodenum, as a rule, but on account of fewer openings in the tip, makes the aspiration more difficult at times than the Einhorn tube. This tube gave the best results for rapid aspiration of duodenal contents for diagnosis.

The Gross tube is only used for diagnosis. It enters the duodenum readily and is easy to aspirate on account of its large size, but the rubber-covered tip is rather large and clumsy and the tube is decidedly harder to swallow and retain. For these reasons we have not used it much.

The position of the end of the tube was determined either by the fluoroscope or by the milk test. The latter consisted in giving the patient a few swallows of milk and then aspirating gently through the tube after a minute. If the tip of the tube is in the stomach the milk promptly returns through the tube; if the tube has passed through the pylorus into the duodenum, the pylorus has almost always closed about it and no prompt aspiration of the milk is possible. This is the simplest clinical method of determining the position of the end of the tube for routine work and is reliable in almost all cases. If the pylorus is relaxed the milk may pass promptly into the duodenum and be aspirated through the tube, and thus the tip appears to be in the stomach when it actually is in the duodenum. This has rarely happened in my experience. Of course, the presence of some pancreatic ferments is not evidence in itself that the tube is in the duodenum. These may be obtained above the pylorus at times.

RESULTS.

The results show that the tubes reached the duodenum in about 30% of the cases within 15 minutes; in about 30% more within a half hour, and in about 20% more of the cases within one to six hours. In about 20% of the patients the tube had to be left in over night in order to reach the duodenum.

Some difficulties were met in adapting the routine to different sizes of patients and different sizes and shapes of stomachs.

The chief causes of delay was coiling up of the tube in the stomach if fed in too fast, and dropping back of the tip into wrong positions if fed in too slowly, especially, dropping back into the left side of the stomach, and to the left of the high ridge of the spine, when the patient turns from a right lateral position upon his back.

Peristalsis was found to have little effect on the rate of passage of the tube through the stomach until the tip is close to the pylorus, then peristalsis pushes it through.

Food delayed the passage of the tube through the stomach, largely by interfering with the action of gravity and the rapid placing of the tip close to the pylorus.

The tube could be passed through the empty stomach by the aid of posture in about a half hour in the majority of cases; the presence of

an ordinary meal would delay the passage of the tube three or four hours, or even more.

The rate of swallowing the tube affected the time of its passage through the stomach. This was more easily controlled in the tubes with a heavy tip. The tube passed on more steadily if it was swallowed at a rather slow rate. It was important not to try to feed it in too rapidly, for the tube tends to get ahead of the capsule, and kink or roll up, and delay its passage. It was desirable to have very little slack, but to have the capsule move along steadily ahead of the tube. This was best arranged as a routine by swallowing the tube to the 50 cm. mark in the erect position; then slowly in to 60 or 65 cm. in the second position; then slowly in to 70 or 75 cm. in the third position, taking about five minutes in each position.

The shape of the stomach had a definite effect upon the rate of the passage of the tube. The high, transverse, so-called "horn-shaped" stomachs hastened the passage of the tube, the vertical, hook-shaped, relaxed, and low stomachs delayed its passage from one-half an hour to an hour or more in the more marked cases.

Obstruction of the pylorus due to spasm or organic disease naturally delayed the passage of the tube, and in marked cases may render the test impossible by keeping the tip in the stomach. Fortunately, these conditions were rarely met with in the type of cases where the tube was used for diagnosis; where the spasm was associated with hyperacidity it was easily relaxed by the use of alkalis or atropin.

The practical application of the above data is as follows: the quickest way to enter the duodenum is to get the tube close to the pylorus within a short time. This is best accomplished by using a light tube with a heavy tip, swallowed by the fasting patient in the erect position, feeding the tube in slowly and steadily, and taking about five minutes in each of the three positions described.

From the above data it is seen that the attempt to develop a rapid method of passing the tube into the duodenum has proved a partial success. More than one-half of the cases were quickly intubed and disposed of. In a large per cent., however, this was not possible, even with the use of the heavy tipped tube, and it was necessary to let the patients lie on the right side for several hours or more to reach the duodenum. In short, the quick method saves much time and usually works; the slow method was, however, more reliable, and always used if the first failed. Since so much depends upon a negative test for ferments in diseases of the pancreas, we must be sure that the tube is in the duodenum, and not in the stomach, and for this reason all negative results should be repeated, using, preferably, the slow method of introduction and the Einhorn tube. The rapid introduction of the tube is a more expert procedure than the slow over-night introduction and requires more atten-

tion on the part of the physician, but I have usually found that a nurse could handle the tube satisfactorily after a little experience and with careful directions.

(To be continued.)

HALLUX VALGUS.

By CHARLES F. PAINTER, M.D., BOSTON.

In the past three years there have appeared two* papers on this subject by American authors. One of these discussed the subject thoroughly; the other dealt chiefly with the operative treatment. Perhaps there is nothing more to say now that is worth while in this connection—at least not before some new method of treatment has demonstrated its superiority over those already existing. However, it seems to me that there are two features, not sufficiently considered by those who have discussed the subject, that deserve recognition. One of these refers to the etiology of the trouble and the other concerns the most serious objection to that method of operative treatment which the majority of surgeons regard as highly satisfactory. If the following observations upon etiology are accepted, there can be no ground for the employment of certain of the methods of operative treatment advocated. When one regards the long list of surgical procedures that have been proposed, but little reflection is needed to see that there are more methods suggested than there are possible variations in the lesions of hallux valgus. At the most, this condition is merely a deviation of the great toe away from the median line, which deviation is accompanied by the formation of a bursa in a goodly proportion of cases, and certain other static disturbances in the foot, incident to it, all of which are painful and may be more or less disabling.

To meet this simple condition Metcalf has cited 15 different operations†. It would seem that there should be a single, simple method capable of meeting the surgical condition, applicable to all cases needing operative treatment. Such a procedure should be based upon a recognition of the etiological factors in the cases, as well as upon the physical conditions to be met by the operation.

Let us look for a moment at the anatomical conditions present in a hallux valgus. In the first place, it is not uncommonly the manifestation of an hereditary tendency. The type of foot which lends itself to the development, under the right sort of stress, of this deformity is probably what is inherited—not the deformity itself. One rarely sees a hallux valgus in a patient who has not the evidence of a "broken"

anterior arch, meaning by this a broad foot at the level of the metatarsal heads, a foot that is capable of considerable compression when the anterior arch is squeezed together behind the heads of the first and fifth metatarsals. There is often a flattening behind the metatarsal heads instead of a slight convexity. Usually the foot is arched in both directions at this point. There is often a great deal of callus formation beneath the anterior arch of the foot. There is frequently to be noted a tendency for the proximal ends of the phalanges to be depressed into the sole of the shoe, the angle which they make with the metatarsals being nearly a right angle. The great toe is apt to rotate to such an extent that the weight is borne on the side of this member rather than upon its plantar surface. Most conspicuous of all is the tendency to redness and bursal thickening over the inner aspect of the great toe and occasionally over the head of the fifth metatarsal. Occasionally these become infected and the bursa suppurates. The great toe may overlie the two adjoining toes in extreme cases.

Associated with these static disturbances in the great toe are to be noted corns and callosities on other toes which in themselves are painful and seriously impede locomotion.

In many cases the patient has observed that the anterior arches of the feet have spread, necessitating the purchase of wider shoes, and associated with this spreading has been the development of hallux valgus. The common explanation of this deformity is that it is caused by short shoes. That it is a shoe deformity I think there can be but little doubt; whether a short shoe is an adequate explanation or not is a matter of some doubt.

Most shoes, particularly women's shoes—and it is among women that this deformity is most common—narrow from a point about opposite the first metatarso-phalangeal articulation forward to the tip of the great toe. A similar curve is observed on the outer side of the foot from the fifth metatarso-phalangeal joint forward. There is a good deal of variation in the relative lengths of the phalanges, the metatarsals and even of the other tarsal bones. On the other hand, for a given length and width of foot a ready made shoe varies not at all in a given style in the distances from the points where the shoe begins to narrow toward the toes. If, therefore, the foot, from the point of view of the shoe-dealer, calls for an 8-D size, for example, it may well be that a person with abnormally long metatarsals may have the metatarso-phalangeal joint carried from a quarter to a half inch further forward in the shoe than the point where the shoe begins to narrow and yet the shorter phalanges may not carry the tip of the toe any further forward than is consistent with a well-fitting shoe, so far as length of foot and length of shoe are concerned.

Add to this the fact that the anterior arches

* Metcalf: BOSTON MED. AND SURG. JOUR., Aug. 29, 1912.

Henderson: JOUR. A. M. A., Oct. 16, 1915.

† Metcalf, loc. cit.

in these individuals spread laterally and the thrust of the foot as one rises on the toes tends to crowd the "fore" foot toward the front of the shoe, where it is narrowest; you have factors operating which combine to produce this deformity and its accompanying static disturbances.

Now let us notice what one finds in the examination of these cases of hallux valgus and what one observes to be the pathological changes in the head of the bone when it is removed at operation. Also one needs to study the gross



FIG. 1. Note the position of the phalanx in reference to the metatarsal, as well as the dislocation of the sesamoid. There is no trace of hypertrophy of the metatarsal head. A considerable portion of the articulating surface of the metatarsal head is never in contact with the phalanx.

anatomy of these cases both in the beginning and well-advanced types. To palpation and inspection there does not seem to be any gross osseous thickening over the head of the fifth metatarsal even in cases where there is marked deformity.

The x-ray examination does not reveal any appreciable thickening of the metatarsal or phalanges. Except where there have been some osteo-arthritic changes in the bone due to a diathesis, I have seldom observed any enlargement of the metatarsal heads. The conspicuous change which one notes in these specimens is an atrophy and oftentimes an erosion of the inner articulating surface of the metatarsal. It is this surface that is not apposed to the corresponding

articular surface on the phalanx and this lack of apposition results in the alterations of the bearing surfaces above mentioned. Figure 1 illustrates this very well, for the proximal end of the phalanx has slipped well off to the outer side of the distal end of the metatarsal and there is no enlargement of the end of the metatarsal. In some of the most pronounced cases that I have observed, when capacity for correction by forcible adduction of the great toe is still present, there is no undue prominence of the metatarsal head when the deformity has been corrected.

These facts, I think, pretty conclusively show that hallux valgus is not an exostosis of the metatarsal head or its articulating phalanx. If it is not this then it is merely a lateral deviation of the great toe at the outset, accompanied by stretching of the inner capsular attachments and later on by structural alterations of the articulating surfaces no longer in use, dependent upon lack of function.

If these premises are correct as to etiology, and anatomico-pathologic changes are as they have been stated and their cause is properly interpreted, their treatment should divide itself into two phases: First, where the deformity can be manually overcome, an attempt should be made to correct it by mechanical means, employing night splints to adduct the toe and a toe post in the shoe for day use. Manual stretching and proper shoes are also needed. One of the most extreme cases of this deformity kept the toe wholly correctible by daily forcible stretching. When the deformity was overcome there was not the slightest excrecence on the inner aspect of the metatarsal head.

The second phase requires operative treatment. If there is no exostosis then none of the operations contemplating the shaving off of a lateral sliver of bone from the metatarsal and phalanx are logical surgical procedures. The presence of an intermetatarsum is so rare that its removal as a cause of hallux valgus needs to be remembered only as an occasional necessity. Tendon transplantation is scarcely more worthy of serious consideration.

The operation that makes the strongest bid for first place is the old Hütter operation. The removal of the head of the metatarsal and preservation of the phalanx satisfies the demands of the probable anatomic cause referred to above when discussing the etiology, viz. the fact that the metatarsal may be too long. This operation shortens it and permits conformity to the ready-made last. It equalizes pressure in the metatarsophalangeal joints by squaring up the unopposed articulating surfaces.

This procedure, when accompanied by resection of the bursa, when enlarged, meets all the anatomic and pathologic conditions presented by the situation, and has only one objection raised against it: viz. that the chief buttress of the anterior arch is weakened by the

operation and occasionally this may be true, though in the majority of instances the functional results obtained after this operation are excellent.

To those who have had experience with the method of Hüter, the tendency of the phalanx to ride up after the removal of the metatarsal head is familiar. This results in leaving the toe out of contact with the floor when the patient stands. This may be avoided in most cases by using a metal splint after the operation, so designed that the proximal end of the phalanx is prevented from riding up by an arm that exerts pressure on it from above at the same time that a flange makes pressure against the outer side of the first phalanx of the great toe in such a direction as to keep the toe in a straight line with the long axis of the shaft of the metatarsal. This is made of German silver, can be sterilized and put on at the time of the operation and worn through the two weeks that weight bearing is not permitted, and longer if necessary. It is unreasonable to suppose that one can remove from the joint a piece of bone three-eighths to one-half inch in length without its being missed from the cavity of the articulation. Time must be allowed for the capsule to shrink down to fit the new situation and some restraint must be enforced upon the bones entering into the makeup of the joint so that cicatrization and contraction of the capsule may go on symmetrically and uninterruptedly.

After about four weeks' convalescence a patient with the Hüter operation can generally walk with a fair degree of comfort and will be permanently relieved.

There seems to be no flaw in the chain of evidence which places upon etiology and pathology the responsibility for the justification of surgical treatment by means of the simple procedure of Hüter. It is, in my opinion, unnecessary to complicate this operation by turning in the bursa between the end of the metatarsal and the adjoining phalanx. For the reason that the cause is frequently, if not always, an anomalous development of the tarsus and metatarsus it seems irrational to resort to wedge-shaped excisions of portions of the metatarsal which do not result in shortening the bone at all. The disturbance of the support of the anterior arch by a bone operation upon the first metatarsal head, which has constituted the one serious objection to Hüter's method and has led to the suggestion of some other procedures, may be obviated by the employment of a post-operative splint.

There is probably no surgical procedure practised which brings more comfort than that which relieves one who has suffered for long years from the discomforts of a hallux valgus.

THE CHOICE OF A CLIMATE IN CASES OF BRIGHT'S DISEASE AND NEPHRITIS.*

By GUY HINSDALE, A.M., M.D., HOT SPRINGS, VA.

Secretary, American Climatological and Clinical Association.

THE questions are frequently asked: "What climate is best for a person with Bright's disease or nephritis?" and "In what way, for better or worse, does climate affect the kidneys?"

In a general way the impression seems to be that damp and cold climates are unfavorable and that warm and dry climates are beneficial; and that is probable true. For the last ten years I have been more or less interested in collecting data bearing on this subject so that it could be definitely shown just what localities might be advised and why they are beneficial.

One way of approaching this subject is by a study of mortality records, comparing those of different localities. The first criticism of this method is that "the registration of deaths gives a very imperfect view of the prevalence of disease. . . . It is fallacious to assume any fixed ratio between sickness and mortality." This is particularly true of infectious diseases, but the relationship is a little closer for the diseases we are considering. In the absence of morbidity records we have to rely on mortality statistics, and, of course, choose those coming from communities where there is some adequate system of registration.

And right here we meet with various difficulties. One of the first concerns the estimate of population. It is well known that in some communities there is an overwhelming desire to overestimate population; this, of course, apparently lowers the death-rate, and in the absence of an accurate census it leads to irregularities in the ratios, independent of other factors in the case. In rapidly growing communities where the boom spirit prevails, this should not be lost sight of. Then, again, the nature of the population makes a great difference. The more settled communities have a larger proportion of people over 50 years of age; but where migration is a factor in adding to the population, it averages younger and chronic degenerative diseases are not so prevalent.

The occurrence of kidney disease doubtless has to do with personal habits, such as the use of alcohol, and with occupations such as mining, etc., with worry, hurried eating, especially of meats, and lack of exercise.

Without much intention to make a choice, excepting that the localities should be well distributed, I noted on three different years the combined mortality from Bright's disease and nephritis from statistics of twenty-five cities and obtained the following results, for which I am

* Read by title at the Thirty-first Annual meeting of the American Climatological and Clinical Association, San Francisco, June 18, 1915.

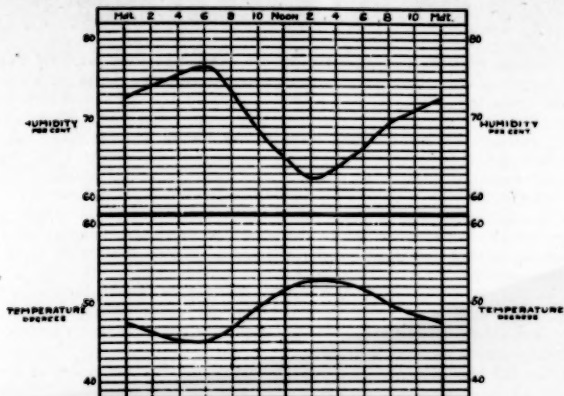


CHART I. Relative humidity (bi-hourly), Chicago, from May, 1911, to April, 1912, inclusive, showing inverse relation to temperature.

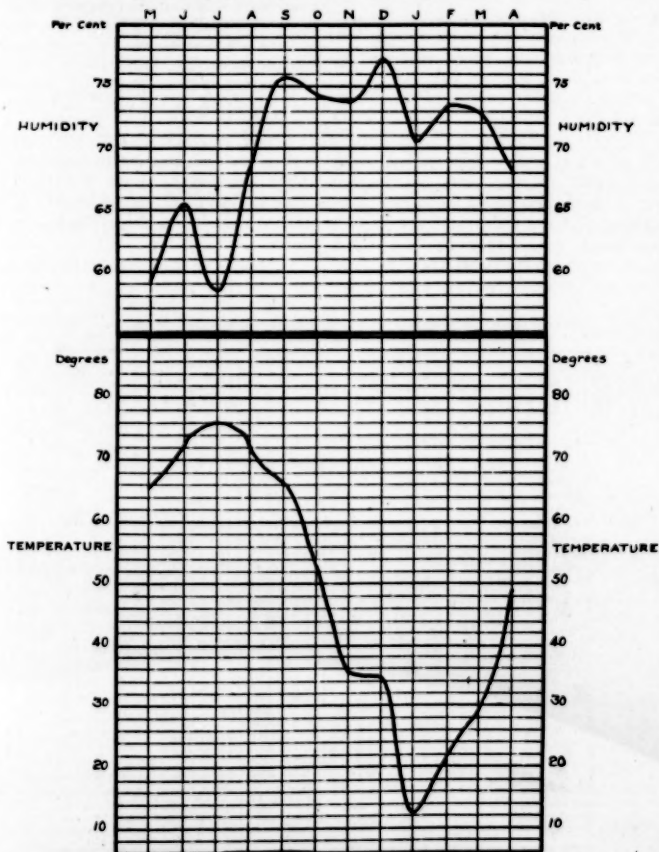


CHART II. Average relative humidity and temperature for Chicago, by months. Cox and Armington, "Weather and Climate of Chicago."

indebted to the various registrars of vital statistics.

I also obtained from the Chief of the United States Weather Bureau the relative humidity of the different stations as far as they were recorded. The average relative humidity is observed in the government service at all stations here given at what is known as 75th meridian time, or at 8 A.M. and 8 P.M. Washington time. This is necessary for the service, but in practice it calls for some observations at 8 A.M. and for others at one, two, or three hours earlier in the day, according as the station is situated, where eastern, central, mountain, or Pacific time is used. Two or three hours earlier in the morning tends to much higher records, and two or three hours earlier in the afternoon to lower humidity records, especially when the days are short.

The relative humidity, measured hour by hour, shows a wider diurnal variation than in the case of the temperature, as seen in the accompanying diagram for Chicago, which shows the inverse relation of the two curves.¹

It will be noted that the cities here listed have been arranged for our purpose in the order of mortality for 1914, beginning with the highest and closing with that of lowest mortality. Some interesting features are apparent. In the first place, there is no obvious relation between mortality statistics of these cities and the records of relative humidity as they are furnished. Another curious circumstance is that the mortality figures for Colorado Springs and Denver

are nearest to those of New York, San Francisco, and Boston. Here we have two famous localities in the high and dry air of the Rocky Mountain region no better off, apparently, as far as mortality from acute Bright's disease and nephritis is concerned, than Boston, New York, and San Francisco at sea level and subject to the characteristic climates of the Atlantic and Pacific seaboard. It seems to be true that Omaha, Nebraska, among the cities mentioned, has the lowest death-rate from the diseases we are considering.

Another note may be made, and that is that "the old order changeth," and that as years pass, few cities preserve a consistent position in the line.

Through the courtesy of the University of Chicago Press, I am able to show a chart illustrating the relative humidity by months in fifteen cities in the United States, arranged by Professors Cox and Armington. Now if we take the states that have adopted a system of registration, we find something more significant. In the accompanying table, taken from the United States Government mortality records, which I have arranged in the order of highest mortality for the year 1913, there is a decided grouping. The New England and Middle States, together with Maryland and North Carolina, fall in the upper division of high mortality, while the lower division of least mortality is almost exclusively made up from Central and Western States.

A glance at Table II shows at once that a low mortality from the causes we are consider-

TABLE I.—DEATHS FROM NEPHRITIS AND ACUTE BRIGHT'S DISEASE. RATE PER 100,000 LIVING.

	1904	1908	1914	PERCENTAGE OF RELATIVE HUMIDITY		
				8 a.m.	8 p.m.	Annual
Petersburg, Va.	243.0	302.6	320.0	—	—	—
Galveston, Texas	—	268.7	226.0	83	77	81
Ogdensburg, N. Y.	278.2	181.3	103.0	—	—	—
Albany, N. Y.	208.2	175.0	185.0	76	66	—
New Orleans	196.6	222.2	184.0	84	72	78
Baltimore	161.4	159.7	160.1	70	62	—
Philadelphia	160.0	160.7	153.5	75	65	—
Jacksonville, Fla.	200.0	195.3	142.5	81	73	80
Providence, R. I.	154.9	119.6	125.6	72	71	—
St. Joseph, Missouri	32.7	52.8	120.0	81	61	—
Newark, N. J.	140.0	122.7	114.2	—	—	—
Boston	79.6	89.4	110.0	72	70	—
San Francisco ..	123.2	75.0	109.0	86	69	80
Colorado Springs	80.0	75.9	106.0	—	—	—
Denver	114.3	120.7	102.2	67	43	51
New York City	174.5	145.7	101.0	70	61	73
San Antonio, Texas	82.0	124.5	90.0	86	58	—
Toledo, Ohio	67.0	69.1	89.0	78	68	—
Columbus, Ohio	54.0	78.3	84.8	80	65	—
Chicago	100.0	98.7	83.4	72	65	75
Portland, Oregon	58.0	73.8	69.0	—	—	87
St. Paul, Minn.	56.0	73.6	68.0	80	—	—
Pittsburgh, Pa.	55.0	66.7	65.6	74	61	—
Milwaukee, Wis.	58.5	64.4	63.7	76	70	—
Omaha, Neb.	64.1	50.3	55.3	78	60	70

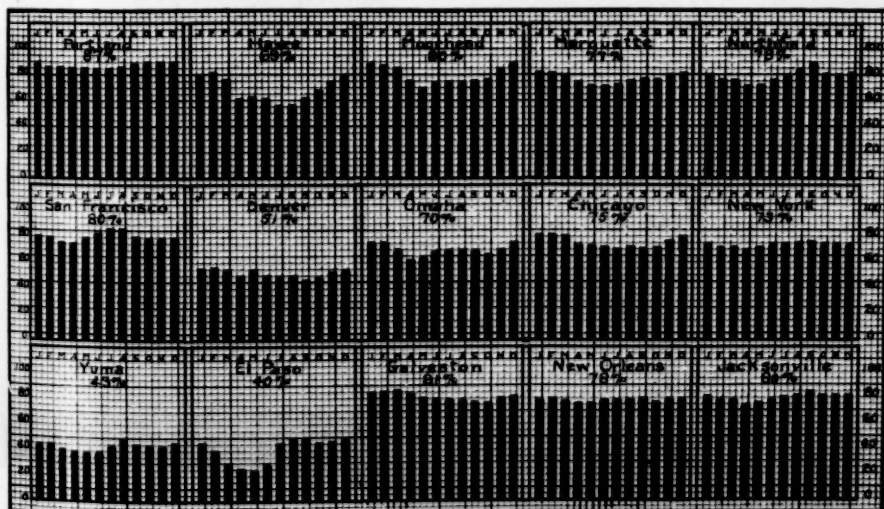
TABLE II.—DEATH RATE FROM NEPHRITIS AND BRIGHT'S DISEASE IN STATES PER 100,000 POPULATION.

	1912	1911
Maryland ...	130.4	140.1
New York ...	138.5	134.7
Rhode Island ...	123.6	123.9
New Jersey ...	117.1	121.8
New Hampshire ...	121.7	118.8
Vermont ...	115.7	115.6
Connecticut ...	106.3	112.0
North Carolina ...	106.0	105.1
Pennsylvania ...	94.4	103.0
Maine ...	101.4	102.7
California ...	95.3	98.7
Missouri ...	98.4	95.2
Virginia ...	—	93.9
Indiana ...	92.9	92.7
Ohio ...	90.1	87.6
Kentucky ...	75.4	80.3
Colorado ...	83.0	75.5
Michigan ...	75.4	74.9
Minnesota ...	70.6	72.5
Utah ...	69.6	64.7
Wisconsin ...	67.2	63.4
Montana ...	60.6	58.9
Washington ...	49.9	55.6

ing is not always associated with a low relative humidity, as in the case of Washington. Perhaps we may see in this table some solution to our problem.

Turning now to clinical evidence as to climatic influence on acute and chronic kidney diseases, we find some interesting observations which may lead to some practical conclusion. The most useful studies in this particular seem to have been made in Colorado and Texas.

Dr. Sewall has reviewed this whole subject in a careful paper which gives us some insight into the problems involved. Making his observations at Denver, elevation 5,280 feet, he has clinical evidence that cases of acute nephritis subside apparently as readily there as, judged by the literature, they might be expected to do at sea level; and that cases of chronic nephritis may apparently recover or continue to live in comfort for years.



Average annual and monthly relative humidity in per cent. for fifteen selected cities, 1889-1910. Cox and Armington.

Dr. Sewall calls attention to the fact that the solid tissues, fluids and gases throughout the body are under a certain tension, which exactly balances the pressure of the atmosphere upon the surface. "It would seem to follow that when one enters a pneumatic chamber in which the air pressure is lowered, or ascends from a lower to a higher altitude, there would be a movement of the labile (more movable) parts of the system from the interior towards the exterior. As has been said by others, it is as if the whole surface of the body, including the lungs and skin, were under a great cupping glass. There would be congestion of the skin through filling of the superficial vessels, and, presumably, determination of blood to the air passages and alveoli."

This cupping glass theory of the physiologic effect of diminished barometric pressure has a firm hold on the medical profession, but that it is erroneous for all ordinary conditions has been demonstrated. There is no doubt that with gradual ascent from a lower to a higher elevation, external and internal pressures keep equal pace.² The view of Haldane and his colleagues, founded on experiences on Pike's Peak, Colorado, that all the physiological phenomena peculiar to high altitudes are directly or indirectly the result of lowered oxygen tension in the air, must be depended upon to explain the facts.³

We all know that certain classes of persons, those who are rheumatic or gouty, are unpleasantly affected by a change in the weather. With the onset of bad weather, in other words, by a more or less marked fall in the barometric pressure, the onset of a cyclonic storm, the affected joints and muscles ache. Such persons are probably known to all of us and naturally excite our sympathy. Men who worked in caissons under abnormally high atmospheric pressure, measuring as much as thirty-eight or forty pounds to the square inch, in the railroad tunnels under the Hudson River and East River, suffered these pains in a marked degree. Hence unusual precautions were taken in restoring them to the usual atmospheric pressure. By means of a series of air "locks" during the period of decompression, an equilibrium is gradually restored.

A fall of barometric pressure, as Dr. Sewall shows, can produce painful sensations in three ways: (1) The mere mechanical redistribution of the body fluids may excite, like a movement of massage, the nerve filaments—made abnormally sensitive by a chronic inflammation; (2) the accumulation on the surface of blood containing an excess of intermediary (poisonous) metabolites may, as in gout, cause precipitation of irritative matters in the muscles or connective tissues; (3) the circulatory changes in the metabolic organs, particularly the liver, may so interfere with their oxidative powers as to lead to the abnormal accumulation of the products of intermediary metabolism.

As has been mentioned previously, when atmospheric pressure is lowered, the venous system becomes engorged and the venous blood-pressure becomes abnormally high; and this seems to be true of the class of cases we have been considering.

Temperature Changes.—We know that a fall of temperature makes the peripheral blood-vessels contract, with a corresponding dilation of the deeper vessels. Relaxation of the superficial vessels is by no means so prompt as their contraction, and in cold weather active measures, such as friction and massage, may be required to overcome the stasis of the blood and lymph. Thus we see that the effect on the kidneys of a fall of temperature is to increase the volume of blood in the kidneys and to promote a rise of arterial tension by increasing the velocity of the blood flowing through them (and in all the deep-seated viscera) to increase their excretory activity and output.⁴

The associated cutaneous anemia decreases the sweat and, as a consequence, the watery excretion of the skin devolves for the time being upon the kidneys, lungs, and intestines, and chiefly, as far as evidence goes, on the kidneys. Generally speaking, temperature rise produces the opposite effect of temperature fall, though not so quickly.

We know that when the bodily surface is exposed to cold the oxidizing capacity in the tissues thus cooled is lowered. When the extensive skin envelope is deprived to some extent of its oxidizing capacity by cold the body falls back on its heat regulating apparatus to maintain its proper metabolism and a constant normal temperature of the blood. Increased oxidative capacity is, therefore, necessary elsewhere than at the periphery. It has been determined that a bath in water at 61° F. increases the oxygen absorption 47%, while douches at this temperature cause an increase of oxygen absorption of about 110%. This remarkable counter-effect is brought about by the heat regulating mechanism. Metabolism is greatly stimulated by cold applications, especially when accompanied by active or passive exercise.

By analogy we may reasonably conclude that the same stimulus to the metabolic processes takes place in the presence of cold air as it does under the stimulus of cold-water applications. and, provided an adequate reaction occurs and the general circulation is maintained and the kidneys are unimpaired, the normal tissue changes go on in an uninterrupted and normal manner. When the available oxygen supply is large the increased metabolism is automatically and physiologically maintained.

It has been observed that the great majority of cases of uremia occur in cold weather, and this would bear out the conclusion that faulty oxidation, which is primarily lowered by cold, is an important agent in causing uremia, the kidneys in that case, as well as the heat regulat-

ing apparatus, not being in a normal state of efficiency.⁵ The primary cause of uremia is a deficient oxidation of protein derivatives and the danger is in proportion to incompletely oxidized protein derivatives in the urine.

Atmospheric Humidity.—The influence of atmospheric humidity upon the functions of the kidney is through its effect in promoting or retarding cutaneous and respiratory evaporation. With respect to the skin, evaporation from a moist surface depends, in a quiescent air, on the relative humidity. The nearer the point of saturation the slower the rate of evaporation, and the greater the deficit of saturation (low humidity) the more rapid the rate. So that in any given case the actual amount of water that may be evaporated will depend upon the temperature and on the wind movement. We see at once the great necessity of proper clothing that evaporation may not go on too rapidly. Professor Phillips states that in a quiet atmosphere at 30° F. and 80% relative humidity, a cubic foot of air could receive but .038 of a grain of water more before becoming saturated; whereas at a temperature of 80° F. and the same relative humidity in the same time, a cubic foot of air could take up .219 of a grain, or about six times as much.

Wind.—There is yet one important element of climate that must be considered in this connection and that is wind. In connection with temperature and humidity, wind assumes a great importance when we consider the extent of our skin covering.

Now the wind, as we know, intensifies the action of temperature change. When, as is usually the case, the atmospheric temperature is lower than that of the body, the greater the velocity of the wind the greater the loss of heat, other conditions being equal. Cold winds can lower the temperature of the skin or of the body itself, as any of us can easily verify. If it is so in health, how much greater will be its effect when the body and its internal organs are diseased. And when we consider that in such subjects imperfect metabolic products are liable to accumulate in the tissues as a result, or as a concomitant, of the blood lymph stasis already mentioned, we can understand that these effete products when thrown into the blood, upon restoration of normal circulation, may act as irritants to the kidney cells.

Soil.—Undoubtedly the character of the soil has much to do with the prevalence of nephritis just as in the prevalence of phthisis. A cold, damp, clayey soil, with sudden variations of temperature, is likely to chill the feet, and this co-operates with the bad effects of intemperance, overwork, and errors of diet which set on foot nephritis.

It is important to bear in mind that there is a distinctive difference between the false albuminuria of a cystitis or pyelitis and the true albuminuria of a nephritis. In Arizona, espe-

cially during the hotter season, it is not uncommon for persons to urinate only once or twice a day. The urine becomes concentrated and cystitis of a mild grade ensues and is followed by an increased desire to pass urine, though the quantity is small. The bodyweight is reduced in the arid regions. Dr. Thomas Darlington, who formerly practised medicine in Arizona, ascertained that among fifty-eight persons of whom inquiry was made, only one had gained weight. Hence we see the improbability of persons with wasting diseases gaining weight in such a desiccating climate.

The southern portion of Arizona, which has a much more moderate altitude than the northern portion, southern California, or almost any part of the great interior valley of California, are desirable localities for persons with Bright's disease. So, also, are the interior stations in the Pacific slope and the Great Plains, including Nebraska, Montana, Colorado, and Utah.

One of the most brilliant examples of recovery from chronic kidney disease known to the writer followed removal from an eastern city to San Diego, California. After a few years perfect health resulted and a most useful life was spared. It is now thirty years since, as an invalid, he left his eastern home, full of anxiety as to the future, which had in store for him only the richest reward.

San Diego has been said to have "the driest marine climate." It is a cool moist climate with much sunshine. The mean annual relative humidity is 75%, varying from 67% in December to 80% in July and August.

Altitude.—Nephritis is not influenced unfavorably by high altitude. A great many cases of nephritis do remarkably well in Western Texas, in New Mexico, and along the slope of the Rocky Mountains, at five or six thousand feet elevation. Others do very badly.

In a recent communication from Dr. Edward C. Hill, of Denver, who has made many thousand urinary analyses during a long residence in that city, the opinion is expressed that true renal albuminuria is comparatively rare in Colorado, passive congestion from heart weakness and dilation being far more common. Personally he has observed but a small number of cases of nephritis which could be directly attributed to alcohol. He states that acute nephritis, though not commonly observed, is exceptionally severe; chronic parenchymatous nephritis appears to terminate fatally in about the same time as at lower altitudes. The chronic interstitial type of the disease, on the other hand, is influenced favorably by this climate, and he attributes this to its tonic invigorating qualities. Slight transient, circulatory albuminuria, due chiefly to high blood-pressure, is frequent in Denver. Of heterotoxic forms of albuminuria, that due to metallic poisons is seen rather frequently among the miners and about the smelters.*

About ten or twelve years ago Dr. Wm. S. Carter, Professor of Physiology in Galveston, Texas, made comparative observations at Boulder, Colorado, and Galveston, Texas, in an effort to ascertain what relationship, if any, exists between the temperature and humidity of these localities and the occurrence of Bright's disease.

Carter approached this subject by a series of experiments and observations on the consumption and elimination of water in these two localities. Galveston is at sea level with a warm and moist climate; Boulder has an elevation of 5,400 feet (1,636 metres), and its climate is much dryer and cooler. The observations at Boulder were in July, 1899; those at Galveston were in the following September, and in the same month in 1903. The experiments were first made upon himself. By a strange coincidence the average output of urine in the six days in Boulder and in the nine days in Galveston, 1899, was exactly the same, viz. 1,404 c.c. daily. The average amount of water taken at Galveston was 2,140 c.c., and at Boulder 1,940 c.c. The temperature was rather cool for Galveston, but somewhat warmer than in the days at Boulder. Observations were also carried out at San Antonio, Texas, as well as at Galveston, on four individuals. The results showed that the average daily consumption of fluid was approximately 400 c.c. greater at Galveston than at San Antonio, 225 miles from the coast, and 700 feet above sea level, with a somewhat greater diurnal range of temperature and considerably lower relative humidity.

It is impossible to relate all the details of this excellent study, but it was evident in this, as in other similar climatic studies, that one takes more fluid as drink in a moist climate and passes less urine than in a dry climate. Dr. Carter remarks that the amount of moisture given off by the skin and the lungs in dry climates is not so great as is often thought. The sensible perspiration which results from the effort at heat regulation on the part of the animal economy in a hot moist climate probably accounts for this difference. Dr. Carter was unable, in view of the statistics which were then available to show any relation between Bright's disease and nephritis and relative humidity of the air.

CONCLUSION.

Bright's disease and nephritis are diseases clearly amenable to climatic treatment. Apparently the first requisite is that the air and soil shall be warm, sunny, reasonably dry and free from malaria and disagreeable atmospheric changes. It is a disease attended by extensive degenerative changes in the renal and circulatory organs, and hence it is highly necessary to insure an abundant and undisturbed action of the skin. The locality should be conducive to an out-of-door life the year round. This is the

well-known advantage of the climate of southern California, where the little rain that falls never does anyone any harm.

Our best course is to advise a warm climate first—one having moderate elevation and only a moderate rainfall, with small diurnal variations in temperature, the humidity being, perhaps, secondary in importance to temperature and wind.

The fact that other localities in the extreme north-west, such as the states of Washington and Montana, as well as Colorado, Minnesota, Wisconsin, Michigan, and Utah have such diverse climates, and, nevertheless, fall on the favored group, should not determine their choice as health resorts for renal cases, but would indicate some advantage in the character of the population and that the sum total of the elements of climate in those localities is conducive to a hardy race.

REFERENCES.

- ¹ "Weather and Climate of Chicago," Cox and Armington. Courtesy of Chicago University Press.
- ² Cf. Leonard Hill in "Recent and Further Advances in Biological Science."
- ³ Philosophical Transactions, Royal Society.
- ⁴ For this and subsequent notes on the action of wind, temperature and humidity I am indebted to the excellent paper by Professor W. F. R. Phillips, of Charleston, S. C., in the *Transactions of the American Climatological Association*, 1906.
- ⁵ See Bitman and Walker, *New York Medical Journal*, May 15, 22, 29, June 5, 1909.
- ⁶ *Jour. Amer. Medical Association*, 1905, p. 1173.
- ⁷ *Medical News*, November 12, 1904.

THE PITUITARY BODY AND RENAL FUNCTION.*

By KETIL MOTZFELDT, M.D., CHRISTIANIA, NORWAY.

[From the University Clinic, Medical Department B, Christiania, Norway, P. F. Holst, M.D.]

DIABETES INSIPIDUS is a relatively infrequent disease, the etiology of which, until a recent date, was unknown. It has, however, been considered as connected with cerebral or cranial pathological conditions.

A sharp distinction has been sought to be established between primary polyuresis (genuine diabetes insipidus), and primary polydipsia, based on functional kidney examinations (Tallquist, 1903, and Meyer, 1905).

From Claude Bernard's celebrated piqué (1854) resulted, as is well known, not only glycosuria, but also polyuria. Krause in 1894 presented thirty-four cases of bitemporal hemianopsia, of which seven had diabetes insipidus. Spanboch and Steinhaus demonstrated seven cases of diabetes insipidus in a similar collection of fifty patients.

To the studies and observations which have further induced the thought of the pituitary body should be accredited the name of Schäffer of Edinburgh, who investigated the

* A previous communication on this subject has been made under the title "Hypophyse of diuresis" in *Norsk Magas. f. lægevid.* 1915, Nr. 11.

effects of the hypophysis extracts. In 1901 Magnus and Schäfer demonstrated an increased diuresis in animals treated with intravenous injections of hypophysis extract, which subsequently had been regarded as the "physiological diuretic." Schäfer and Herring demonstrated in 1906 that its effect was dependent on the *pars intermedia*.

A direct connection between diabetes insipidus and the pituitary body was first pointed out clinically by Frank (1912). During the last few years a number of similar communications have been received from Simmonds, Berblinger, Goldzieher, Steiger, Benario and Borelli.

At the end of 1913 a new light was thrown on the subject by von den Velden and Farni, who maintained that the cause of diabetes insipidus is to be sought in an impaired function or lack of function of the pituitary body. Their opinion was corroborated by Roemer's experiments on rabbits. Similar experiences have since been published, amongst others, by Simmonds, Stromeyer, Hohlweg, Umber, Biach, v. Konsensegg and Schuster, Groul and Grondahl.

Cushing found that as a rule polyuria appeared consequent on removal of the hypophysis in human beings as well as in animals.

In experimental work on dogs, Lewis and Mathews in 1913 were able to demonstrate polyuria if *pars intermedia* were removed or injured.

I will now proceed to present the material I have had an opportunity of examining which bears on these questions.

CASE 1. Woman, 42 years of age. Had always been well except for measles, mumps, erysipelas, and otitis media. About Christmas time, 1913, she felt lassitude and subjective symptoms of hemianopsia, which, however, could not be confirmed by the oculist. In the course of three months these symptoms disappeared and have not recurred. In February, 1913, her thirst increased and the diuresis amounted to about 10 liters *per diem*. At the onset

of the disease menstruation ceased. During the first few months she lost 10 kilograms in weight, but regained the same and more later on, so that after six months she weighed 10 kilograms more than at the onset of the disease. Wassermann negative. Roentgenogram showed a normal cranium. The diaphoresis was markedly lowered. Field of vision normal. Skin dry, with faint brownish pigmentation. Blood examination showed some lymphocytosis, but no increase of eosinophils. The subcutaneous fat was abundant, especially on abdomen and hips. The thyroid gland was not enlarged. Urine: sp. gr. 1.004. Albumen and sugar negative. Blood pressure (Riva Rocci) 110.

TABLE I.—URINE OF PATIENT, CASE 1.

Hour.	Quantity (cc.)	Sp. Gr.	Chloride %
7-9 A.M.	100	1.005	0.5
9-11	350	1.004	0.5
11-1	950	1.005	2.0
1-3 P.M.	1000	1.006	2.5
3-5	800	1.006	2.0
5-7	800	1.005	1.0
7-9	600	1.005	1.0
9-11	300	1.004	0.5
11-1	500	1.002	0.5

Obs. At 12 o'clock the patient was given 10 gm. sodium chlorid.

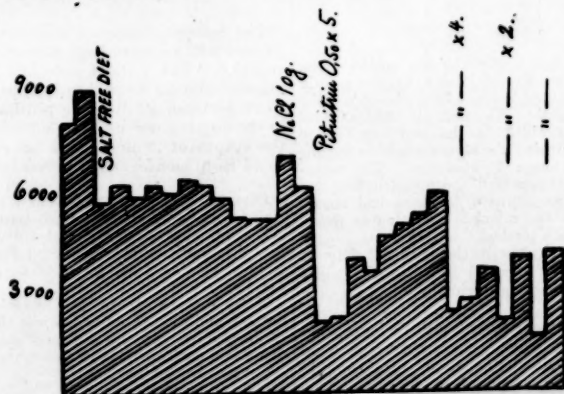
Thirst Experiment: (3 hours.) After this limit of time the patient began to feel uncomfortable.

BEFORE.		URINE.		AFTER.	
Sp. Gr.	NaCl. %	Sp. Gr.	NaCl. %	Sp. Gr.	NaCl. %
1.004	0.5	1.005	0.5		

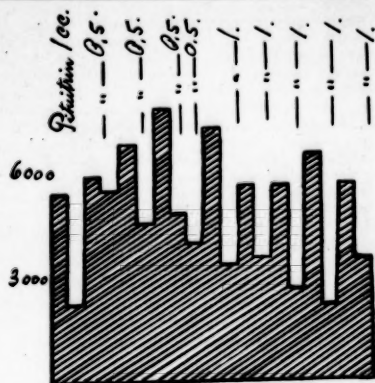
Freezing point depression in the blood:

Before..... 0.56° After..... 0.58°

Carbohydrate tolerance: levulose 250 gm., negative. Was treated with pituitary extract. The diuresis diminished promptly, but increased again the following day, as will be seen in the accompanying charts.



CASE 1.—Diuresis. Oct. 11 to Nov. 9, 1914.



CASE 1.—Diuresis, influenced by pituitrin, when the patient was up and about, following her regular vocation. Dec. 9-27.

TABLE II.

CONCENTRATING EFFECT OF PITUITARY EXTRACT.

Time.	Quant. of Urine cc.	Sp. Gr.	Chlorids. %/100	Remarks.
Oct. 26				
7-9 A.M.	500	1.004	0.5	11 A.M. pit. ext. 0.5 c.c. subcu.
9-11	500	1.005	0.5	1 P.M. pit. ext. 0.5 c.c. subcu.
11-1	370	1.014	4.0	3 P.M. pit. ext. 0.5 c.c. subcu.
1-3 P.M.	80	1.015	4.0	5 P.M. pit. ext. 0.5 c.c. subcu.
3-5	70	1.014	4.0	7 P.M. pit. ext. 0.5 c.c. subcu.
5-7	90	1.014	4.0	
7-9	30	1.017	4.0	
9-1	150	1.014	3.0	
1-3 A.M.	90	1.015	2.5	
3-7	270	1.014	2.5	The chlorids were determined according to Archard-Thomas method.
7-9	120	1.015	2.5	
Oct. 27				
9-11 A.M.	230	1.014	2.0	
11-1	180	1.013	2.0	
1-3 P.M.	240	1.010	1.0	
3-5	160	1.008	0.5	
5-7	200	1.007	0.5	
7-9	250	1.007	0.5	
9-11	250	1.006	0.5	

She was then for a considerable period given pituitrin subcutaneously, and later, by the mouth, entire, fresh pituitary bodies (from the ox). She took seven every night. She slept all night without interruption and voided in the morning 300 to 400 c.c. of urine. During the same period her weight was reduced by about 1 kilogram. The sensation of lassitude disappeared and menstruation was re-established. The pituitrin, however, had apparently no effect on the nitrogen excretion as determined by Kjeldahl's method.

Feeding the patient with the posterior lobe of the pituitary body checked the diuresis, while administration of the anterior lobe had no such effect.

The other treatment given, with the exception of opium, had no effect. As the concentration of the urine remained unchanged after opium, the effect must be supposed to depend on the thirst.

CASE 2. Woman, 23 years of age. The patient had had measles, scarlet fever, and whooping cough. When about six years old she received a trauma on the head and has since been "odd" and very nervous. In 1902 she had chickenpox, and four or five days after its onset she commenced to be very thirsty. Diuresis, 6 to 9 liters *per diem*. The hospital treatment seemed of little avail. In 1909 she had typhoid fever. Menstruation was delayed, commenced when she was about 18, and has remained scanty and irregular. The patient was undersized and thin; looked almost infantile. Weight, 46 kg. Urine: sp. gr., 1.005; albumen and sugar negative. By giving 20 gm. sodium chlorid the diuresis rose from 8000 to 11,600 c.c., while the sodium chlorid concentration increased from 0.25 to 0.51%.

TABLE III.

SHOWING SODIUM CHLORIDE CONCENTRATION IN URINE. THIRST EXPERIMENT.

Hour.	Quantity.	Sp. Gr.	NaCl. %/100
7-9 A.M.	250	1.005	1.4
9-11	200	1.005	4.2
10-11	150	1.005	3.9
11-12	75	1.0075	6.0

Except for a short systolic murmur, nothing abnormal could be elicited on physical examination. Roentgen ray picture showed a normal cranium. Field of vision normal. Wassermann negative. She perspired easily.

On subcutaneous administration of pituitary gland extract (posterior lobe) the diuresis diminished to normal and remained so for twenty-four hours. She slept quietly all through the night, the first time since the disease commenced ten years previously. She experienced no sensations from the injection.

TABLE IV.

THE URINE IN CASE 2 AFTER ADMINISTRATION OF PITUITARY.

	Sp. Gr.	Chlorids %/100	Nitrogen %/100
5 P.M. (Before injection)	1.004	1.	1.41
5.15 Injection			
9 P.M.	1.016	3.5	4.77
8 A.M. (Next Day)	1.011	1.5	3.75

Albumen negative. Sugar negative.

The quantity was not measured because the patient was up and about, following her regular vocation. The patient has just recently commenced to take fresh hypophysis from the ox. Four posterior lobes of the pituitary body taken in the evening proved to be sufficient to diminish the output of urine to such an extent that she could sleep comfortably every night.

CASE 3. Woman, 39 years old. She had syphilis eight years ago and during the last four years had cerebrospinal symptoms of the disease. For the last six months she has suffered from diabetes insipidus, voiding from seven to ten liters of urine *per diem*. (Sp. gr., 1.002-1.003.)

X-ray picture of the skull revealed nothing abnormal, and the field of vision was also normal.

She had cystitis, was dull and uncleanly, and the urine was partly voided in bed.

Carbohydrate tolerance:

Levulose 200 grams: negative.
Levulose 300 grams: vomiting.

Third Experiment of Three Hours' Duration. %/m

Before:	Sp. gr. 1.004	Nitrogen (Kjeldahl) 1.68
After:	Sp. gr. 1.004	Nitrogen (Kjeldahl) 1.69

The diuresis went down from 6000 to 1500 c.c., and the sp. gr. increased from 1.003 to 1.007 upon subcutaneous administration of pituitrin (1 c.c. x 3). The same effect was achieved after two pituitrin injections, while extracts from the anterior lobe of the pituitary body (2 c.c., Parke, Davis & Co.) had no such effect.

Considering these three cases, it seems evident that we have before us "genuine" diabetes insipidus, dependent upon a weakness in or a relative insufficiency of the concentration capacity of the kidneys.

The symptoms pointing towards an ailment in connection with the hypophysis are more variable. In Case 1 we find more of a hypophysial adiposity, while in Case 2 we encounter a condition much resembling the hypophysial infantile state. (Lorain's Type.) As the roentgenograms of the craniums revealed nothing abnormal, and the field of vision in all three cases was normal, it seems unreasonable to suppose an enlargement of the pituitary body. No symptoms justifying the assumption, that we had to deal with a tumor of the hypophysis, were present. Nothing definite as to the anatomical character of the hypophysial diseases can be asserted.

The next question to be answered is whether a hyper- or hypo-functional activity has been caused by disease of the hypophysis. Nothing favoring the hyperfunctional activity theory as a cause of this ailment is present. To throw some light on the symptomatology of the hypofunction, I will relate what Cushing considers to be the cardinal symptoms:

1. High carbohydrate tolerance.
2. Subnormal temperature, slow pulse and low blood pressure.
3. Drowsiness.
4. Asthenia.

As to the first point, a levulose tolerance of 250 and 200, respectively (Cases 1 and 3), must be considered greatly increased. The tolerance was not tested in Case 2.

As regards point 2, my three patients do not meet the conditions set forth by Cushing; they occur to me to be rather exacting, but as regards points 3 and 4, my three cases have all fulfilled these, viz., manifested symptoms of dullness, sleepiness and asthenia.

Subcutaneous administration of extract from the posterior lobe of the hypophysis caused considerable diminution in quantity and increased the concentration of the urine, while administration of the anterior lobe (in Case 1 with fresh gland, in Case 3 with injection of the extract) had no such effect. I, therefore, wish to emphasize that these cases are due to a lowered functional activity of the posterior lobe of the pituitary body (the *pars intermedia* respect).

When we further take into consideration the fact that, although the disease is comparatively

infrequent, a number of cases have been recorded during recent years and their connection with the hypophysis has been proved beyond doubt, and inasmuch as no case has been published disproving such connection, I feel justified in asserting that the majority of diabetes insipidus cases are due to a lowered functional activity of the posterior lobe of the pituitary body.

Since Magnus and Schäfer's work (1901), there was, until the last few years, agreement on the point that the diuresis is increased on the administration of pituitary extracts, and this opinion was given in most text books as an assured fact. Experiments made on animals by Hallion and Carrion, Falta, Herring, Hoskin and Means, Pentimalli and Quercia, Thompson and Johnson, Roemer, Beco and Plumier have, however, led to divergent results. Injections made on human beings have been infrequent, and the experience gained limited. Falta found that the diuresis became increased, while von den Velden, Frey and Kumpiess found that the diuresis diminished. Beco, who made injections in a number of patients suffering from heart disease, found, as a rule, no effect on the diuresis except in a few cases, where he noted a considerable decrease.

This question still being unsolved, and as it is of fundamental importance for the understanding of the genesis of diabetes insipidus, I have endeavored to inquire into the matter. The results may be seen in the accompanying charts.

TABLES OF TESTS.

TABLE I.

Man, 29 years old.

Diagnosis: Diarrhea chronica. Fistula ani.

Day.	Diuresis.	Sp. Gr.	NaCl. %/m	N. %/m	Gr.	Remarks.
Nov. 25	1300	1021	8	11.15	14.5	
" 26	1250	1021	7	10.58	13.2	
" 27	1200	1020	7	11.41	13.7	
" 28	1100	1022	8	11.71	12.8	Pituitrin*
" 29	1200	1020	7	11.52	13.8	0.50 ccm. x 4

TABLE II.

Man, 66 years old.

Diagnosis: Constipation.

Day.	Diuresis.	Sp. Gr.	NaCl. %/m	N. %/m	Gr.	Remarks.
Dec. 18	1700	1012	5.5	6.86	11.7	
" 19	1800	1010	4	6.64	12.9	
" 20	1800	1011	4	7.28	13.1	
" 21	1100	1021	6	11.20	12.3	Pituitrin
" 22	2050	1010	2.5	7.01	14.3	1 ccm. x 3

TABLE III.

Man, 28 years old.

Diagnosis: Cephalalgia.

Day.	Diuresis.	Sp. Gr.	NaCl. %/m	N. %/m	Gr.	Remarks.
Feb. 10	1800	1015	7.0	10.6	19.0	
" 11	1400	1021	8.0	14.1	19.7	
" 12	1200	1020	6.0	15.1	18.1	
" 13	1500	1016	4.5	12.7	19.1	
" 14	1600	1015	3.5	9.8	15.7	
" 15	1200	1019	5	13.2	15.8	Pituitrin
" 16	1450	1015	4	11.2	16.2	1 ccm. x 3

The above arrangement being found inconvenient to the patients, two-hourly records were introduced.

* Subcutaneously, as in every one of the following experiments.

TABLE IV.

Man, 55 years of age.
Diagnosis: Neurosis traumatica.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
8-10	550	1006	6	3.48	1.91	
10-12	450	1008	6	3.92	1.76	
12-2	550	1007	6	3.64	2.00	
2-4	525	1007	5	3.96	1.76	
4-6	225	1013	8	5.18	1.16	At 4 o'clock
6-8	120	1017	12	7.84	0.94	Pituitrin 1 ccm. x 3.

TABLE V.
Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	Urea (Hypobromide Method) %/100	N. %/100	Gr.	Remarks.
8-10	285	1010	8	2.0	0.57		
10-12	240	1011	9	3.1	0.74		
12-2	130	1016	13	4.4	0.57		At 12 o'clock
2-4	90	1018	14	6.4	0.58		Pituitrin 1 ccm.
4-6	160	1014	11	4.5	0.72		
6-8	140	1015	10	5.6	0.78		
8-10	235	1008	6	3.8	0.80		

TABLE VI.
Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
7-9	220	1011	8	5.2	1.21	
9-11	285	1010	5	5.0	1.42	
11-1	240	1012	6	5.1	1.22	
1-3	145	1015	7	5.5	0.79	At 1 o'clock
3-5	130	1016	8	6.1	0.79	vaporol-infundin
5-7	130	1019	7	8.4	1.09	(Burroughs)
7-9	120	1020	9	8.9	1.06	Wellcome) 1 ccm.
9-11	100	1021	9	10.6	1.08	

TABLE VII.

Woman, 18 years of age.
Diagnosis: Ulcus ventriculi.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
7-9	375	1007	3.0			
9-11	390	1007	2.5	3.72	1.45	
11-1	395	1008	2.5	3.61	1.32	
1-3	460	1005	2.0	3.20	1.47	
3-5	250	1009	4.0	5.88	1.47	
5-7	110	1018	8.0	10.50	1.15	At 5 o'clock
7-9	74	1024	6.0	15.20	1.18	Pituitrin 1 ccm

TABLE VIII.

Woman, 31 years old.
Diagnosis: Adipositas dolorosa (Dercum).

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
7-9	230	1011	6			
9-11	355	1010	5			
11-1	225	1013	7			
1-3	160	1016	10			At 1 o'clock
3-5	125	1018	11			Pituitrin 1 cc.
5-7	230	1012	6			
7-9	180	1015	7			

TABLE IX.

Man, 23 years of age.
Diagnosis: Lumbago traumatica.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
6-8	70	1025	10	18.2	1.26	
8-10	160	1019	9	9.1	1.46	
10-12	180	1018	8	7.8	1.41	
12-2	135	1020	10	7.9	1.07	At 12 o'clock
2-4	210	1012	6	7.5	1.57	Pituitrin 2 cc.
4-6	340	1010	4	4.0	1.66	
6-8	200	1011	5	5.6	1.46	

TABLE X.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
6-8	100	1020	15	8.99	0.90	
8-10	280	1014	10	4.48	1.25	
10-12	240	1013	10	5.40	1.29	
12-2	115	1018	15	6.52	0.75	At 12 o'clock
2-4	135	1017	11	8.68	1.17	Pituitrin 1 cc.
4-6	225	1012	8	5.93	1.33	
6-8	350	1008	4	3.67	1.28	

TABLE XI.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
6-8	170	1022	11			
8-10	185	1020	10			
10-12	225	1017	8			
12-2	300	1014	7			
2-4	250	1015	8			At 2 o'clock
4-6	135	1020	10			Vaporol-infundin
6-8	175	1017	9			0.5 cc.
8-10	180	1017	8			

TABLE XII.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
6-8	60	1022	9	13.27	0.79	
8-10	145	1018	10	8.03	1.16	
10-12	290	1012	6	5.09	1.32	
12-2	290	1008	4	4.39	1.27	At 2 o'clock
2-4	120	1022	11	8.17	0.98	Pituitrin 1 cc.
4-6	305	1009	4	5.04	1.54	and adrenalin
6-8	210	1012	6	6.16	1.29	1 cc. simultaneously

TABLE XIII.

Man, 26 years old.
Diagnosis: Pneumonia (reconvalescentia.)

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
5-7	45	1030	11	21.16	0.95	
7-9	115	1026	15	14.69	1.69	
9-11	125	1024	14	12.26	1.53	
11-1	100	1025	15	14.82	1.48	
1-3	155	1022	11	11.20	1.73	
3-5	200	1017	9	8.73	1.75	

Control experiment.

TABLE XIV.

Man, 57 years of age.
Diagnosis: Ulcus ventriculi.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
5-7	135	1015	7	11.20	1.51	
7-9	145	1016	9	11.20	1.62	
9-11	360	1008	5	5.23	1.88	
11-1	180	1011	6	6.35	1.14	
1-3	125	1018	10	8.68	1.08	At 1 o'clock
3-5	125	1020	10	11.11	1.39	Pituitrin 2 cc.
5-7	155	1015	8	9.38	1.45	
7-9	230	1010	5	5.93	1.36	

TABLE XV.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/100	N. %/100	Gr.	Remarks.
9-11	140	1015	7.0	9.01	1.26	
11-1	150	1014	6.0	9.04	1.36	
1-3	160	1012	4.0	7.76	1.24	
3-5	170	1012	4.0	6.84	1.16	
5-7	140	1014	5.0	9.85	1.38	
7-9	185	1011	3.5			

Control experiment.

TABLE XVI.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/m	N. %/m	Gr.	Remarks.
5-7	50	1025	1.0	17.44	0.87	
7-9	95	1021	1.5	18.34	1.74	
9-11	100	1020	2.5	10.43	1.64	
11-1	70	1022	3.0	16.98	1.18	
1-3	95	1019	1.5	17.78	1.68	At 1 o'clock
3-5	90	1020	2.5	17.02	1.53	extract of the
5-7	75	1021	1.5	15.59	1.17	anterior lobe (Parke, Davis) 1 cc.

TABLE XVII.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/m	N. %/m	Gr.	Remarks.
5-7	50	1028	4	18.90	0.94	
7-9	75	1025	8	16.80	1.26	
9-11	125	1020	7	12.46	1.56	
11-1	95	1023	7	15.10	1.43	
1-3	45	1028	9	16.94	0.76	At 1 o'clock
3-5	65	1026	7	17.00	1.15	Pituitrin 1 cc.
5-7	105	1021	6	12.88	1.35	and adrenalin 0.5 cc.

TABLE XVIII.

Woman, 24 years old.
Diagnosis: Dyspepsia.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/m	N. %/m	Gr.	Remarks.
6-8	90	1023	10	11.05	0.99	
8-10	200	1014	7	4.39	0.88	
10-12	130	1016	9	7.39	0.90	
12-2	130	1015	7	6.24	0.81	
2-4	65	1026	10	10.24	0.67	At 2 o'clock
4-6	80	1024	8	13.30	1.06	Pituitrin 1 cc.
6-8	230	1009	3	5.90	1.35	

TABLE XIX.

Same Patient.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/m	N. %/m	Gr.	Remarks.
6-8	90	1020	7.0	9.24	0.83	
8-10	155	1010	5.0	5.70	0.83	
10-12	120	1014	8.0	7.84	0.94	
12-2	90	1018	9.0	9.80	0.88	
2-4	320	1008	4.0	3.63	1.16	At 2 o'clock
4-6	200	1009	4.5	4.70	0.94	extract of the
6-8	90	1019	7.0	10.02	0.90	anterior lobe. (Parke, Davis) 1 cc.

TABLE XX.

Man, 48 years old.
Diagnosis: Vit. cordis. Lues.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/m
6-8	85	1023	9
8-10	105	1020	9
10-12	95	1021	8
12-2	85	1021	8
2-4	85	1020	7
4-6	100	1020	7

Control experiment.

TABLE XXI.

Man, 52 years old.
Diagnosis: Reconvallescentia. Pleuritis.

Hour.	Quantity of Urine.	Sp. Gr.	NaCl %/m
6-8	125	1021	8
8-10	140	1019	7
10-12	120	1020	8
12-2	145	1018	7
2-4	130	1017	6
4-6	120	1018	7

Control experiment.

As will be seen from the tables, the first three experiments were carried out in periods of 24 hours each. When the patients had been on a constant food-ratio for a few days, the diuresis became proportionate to the ingested material.

This arrangement, however, was inconvenient for the patients and consumed a great deal of time. I, therefore, commenced to use two-hour periods, which, although less reliable than the 24-hour tests, still proved to be serviceable. After three or four tests of two hours each, in which the patient received a fixed supply, the diuresis, if not absolutely constant, at least varied to such a slight degree, that a decided difference in one or another direction would easily have been observed. Of course, the food and liquid supply given the patient the day previous to the experiment had a determining influence. If, for instance, full diet had been given the patient the day before, it was, as a rule, impossible to bring the diuresis to a relatively constant level. Had the patient, however, preparatory to the test, been in bed for several days and on milk diet, the quantity of urine, based on the two-hour tests, underwent only slight variations. Conditions of absorption must be taken into account. Retention in the stomach must be excluded. The digestive system, kidneys and excretory apparatus must perform their functions in a normal manner.

The physiological variations in this way of testing will be seen in Control Tests XIII, XV, XX and XXI. The control is otherwise included in each experiment.

All nitrogen determinations are carried out according to Kjeldahl's method, and the chloride determinations according to Achard and Thomas' method (which, however, is not quite exact). The two-hour and the twenty-four hour experiments give identical results:

In each and every experiment the diuresis was diminished, and in most cases to a considerable extent.

In the two-hour experiments the diuresis under the influence of hypophysis extract is in six cases reduced to half or less, as compared with the preceding two-hour period.

The effect of the pituitary extracts has been apparent in all cases during the first two-hour period, and in seven experiments has been most marked in the first period, while in three experiments it was most decided two to four hours after the injections.

The effect lasted only for two hours in four experiments, in seven it lasted four hours, and in one experiment (VII) the effect apparently lasted ten hours or more.

The material collected is too small to allow a comparison between the three pituitary preparations employed; they seem, however, to be somewhat similar in their action. The concentration of the urine is increased both as to nitrogen and sodium chloride. As to this point my results are in contrast to those of von den Velden, who could not demonstrate any in-

creased concentration. The results, at which I have arrived, are otherwise, with exception of Falta's, in full conformity with the few previous observations made on man.

The effect has not been influenced by sex, age or disease. It must, therefore, be supposed that the decreased diuresis and the concentration of the urine are effects invariably produced on man. These effects, however, do not appear to have any relation to the clinical blood pressure.

As will be seen from the tables (experiments XII and XVII) pituitrin and adrenalin are injected simultaneously. This is done for the following reasons:

Stenstroem has proved that the hyperglycemia, which invariably results from the injection of adrenalin in rabbits (and most likely also in man) fails to appear on injecting pituitrin. This fact is in most cases confirmed by Boc. As to the metabolism of carbohydrates, there should exist a certain contrary effect between pituitrin and adrenalin.

My two experiments were intended to serve as preliminary endeavors to find out if this apparent antagonism could be demonstrated also in relation to the urinary functions.

The inhibitory action of the pituitrin on the diuresis remained unchanged, so any antagonism could not be demonstrated.

In experiments XVI and XIX an extract of the anterior lobe of the pituitary body was injected. This extract, which is not handled commercially, was courteously placed at my disposal by Messrs. Parke, Davis & Co. No checking influence on the urine quantitatively was observed. In experiment XIX the quantity even seemed increased. This is also in conformity with previous results, viz., that administration of fresh anterior lobe had no influence whatever on the diuresis in Case 1, the diabetes insipidus patient.

The blood pressure throughout all the injections has been measured by Riva Rocci's apparatus. The influence on the blood pressure has not been universal. Out of 14 patients injected with extract from the posterior lobe of the hypophysis, 9 responded with a rapidly lowered pressure (from 1 to 20 mm.) lasting, as a rule, 2-3 hours. In five other patients, after a few minutes, an increased pressure manifested itself, which increase, however, in another few minutes showed a corresponding decrease. In one experiment only did the blood pressure remain unchanged. These divergent results may be due to individual difference in the patients; it is, however, more reasonable to presume that the preparations employed have not been uniform. They contain a number of chemical combinations which partly antagonize each other. Numerous experiments on animals, made to determine the action on the blood pressure, have led to divergent results.

In my two cases in which extract from the anterior lobe was injected, and in one case of

diabetes insipidus (Case 3) no influence upon the blood pressure has been demonstrated.

THE INFLUENCE ON THE NITROGEN ELIMINATION.

In the total number of patients the supply has been constant during the period of experiment. The nitrogen excreted in the urine has been used as a relative standard (the nitrogen excreted by the feces being of minor importance). For practical reasons the patients have not been placed in nitrogen balance. The excretion, as seen from the tables, has been comparatively constant; any more decided wave would have been apparent. In the nine patients—16 experiments—a total of 105 Kjeldahl analyses have been carried out.

In the first three experiments,—the 24-hour arrangement,—a slight reduction of the nitrogen elimination appeared in two, while in the third it remained unchanged. In the remaining cases,—the two-hour experiments,—in each instance there was found a slight decrease in elimination. It appeared as if the nitrogen elimination to a certain degree followed the diuretic wave. The elimination acted in the same manner in the cases treated with pituitrin and adrenalin simultaneously. Extract from the anterior lobe did not exert any inhibitory influence on the nitrogen elimination.

Experiments on animals, carried out in order to bring light on this matter, are few in number. Oswald found no influence on the nitrogen elimination, while Thompson and Johnson, who fed dogs with dried glands, found an increased nitrogen elimination. They arrived at the same results by injecting extracts prepared from the entire hypophysis. Malcolm, Falta and Mochi came to the same conclusion.

Aschner observed a decreased nitrogen elimination in the case of dogs from which the hypophysis had been removed. These experiments have been carried out with the entire gland, and it is quite possible that the almost unanimous experience, viz., that the nitrogen elimination increases, is due to the anterior lobe. (Cf. my experiments XVI and XIX.)

The experience gained in this matter in the case of man is very limited. Von den Velden found no essential change in the nitrogen elimination of the two normal human beings that he examined. Frey and Kumpless came to the same conclusion, or noted a slight increase, in 6 cases.

The posterior lobe of the hypophysis seems to exert a constant physiological influence on the renal functions. The influence may be brought about in various ways.

1. Directly on the kidneys through the circulatory system.
2. Through influences on the nervous system (autonomic or sympathetic).
3. Through influence on other internal secreting organs.

Assuming that all three factors are in action, the influence may be supposed to be exerted directly on the secreting epithelium of the kidneys or on the renal vessels. As to these questions our knowledge is very deficient.

Falta says that all effects of pituitrin,—the slow pulse excepted,—simulate the effects produced by irritation of the sympathetic nervous system, but he maintains, as before stated, that pituitrin increases the diuresis, an opinion which does not coincide with the results of my investigations.

V. Frankl-Hochwart and Fröhlich found in experiments on animals that certain nerves belonging to the autonomic as well as to the sympathetic system, under the influence of pituitrin showed signs of increased irritability. As far as the kidneys are concerned, this matter has not been investigated, and so far remains an open question.

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Therapeutic and Preventive Medicine.

A SIMPLE AFTER-TREATMENT FOR PERINEAL WOUNDS.

By E. B. YOUNG, M.D., F.A.C.S., Boston,

Junior Visiting Surgeon for Diseases of Women, Boston City Hospital; Assistant Surgeon, Massachusetts Women's Hospital; Instructor in Gynecology, Harvard Medical School.

THE proper care of perineal wounds after operation is not such a simple matter as it is

commonly considered, if the best union is to be obtained, since the parts are often and easily contaminated during the healing process. Fortunately, nature does not seem to require the same degree of cleanliness as in other portions of the body, otherwise it is probable that there would be many more failures to obtain a primary union. However, here, as elsewhere, the better the care, the better the results in the long run.

The method generally employed appears to be cleanliness, aided by antiseptic applications in the form of solutions, powders or ointment. Apparently an aseptic vulvar pad is used by all, and some place a strip of gauze between the buttocks on either side of the sutures.

This general form of treatment, with the various minor modifications which the writer has seen employed, possesses a distinct disadvantage in that it maintains neither dryness nor the greatest possible cleanliness.

Whenever moist gauze is applied, as is the practice with some surgeons, the skin and wound are constantly macerated, while the dry gauze soon becomes moist even when antiseptic powders, as generally employed, are dusted over the parts. Under these conditions, tissues about the sutures become sore and irritated and sutures have a greater tendency to cut into a soggy skin. Ointments, while affording some protection, easily collect particles of feces, and once contaminated, are removed with difficulty.

The vulvar pad increases the perspiration in every patient and especially in those who are obese. There is also another disadvantage to the vulvar pad. Besides absorbing the discharges from the vagina and from the wound, it often becomes soiled from the temporary and partial impotence of the sphincter ani; a condition not infrequently seen after perineal operations, and due to irritation of the sphincter, even where the tear is not of the third degree.

At the last meeting of the American College of Surgeons a considerable number of those present at the Boston City Hospital expressed their interest in the treatment of perineal wounds as detailed below. They also had an opportunity to see its practical application as well as the end results.

The method is not new. It has been used on the Gynecological Service by the writer for nearly ten years, and has been generally adopted for some time as the standard treatment. So far as is known, it is not used elsewhere. The aim is to maintain the greatest possible degree of cleanliness and dryness as under such conditions infection and irritation are least likely to occur.

After twenty-four hours, when the bleeding has ceased, the gauze perineal pad is omitted and the genitals and fissure between the buttocks kept liberally covered with a drying and antiseptic powder. For this purpose various mixtures have been used, the best being the compound stearate of zinc with boric acid. Results

have been good with the stearate of zinc alone but rather better with the boric acid added as there is less tendency to decomposition of whatever discharge may come from the wound or elsewhere. The great advantage of the stearate of zinc is that it sheds water and keeps the parts dry. In practice it has been found that mixtures of stearate of zinc and boric acid made by the physician are not so satisfactory as those prepared by the pharmaceutical firms.

The powder is best applied with the patient lying on the side, the upper buttock being raised and the powder thrown into every fold. It is not sufficient to dust lightly or use a powder blower. The parts must be thickly covered, especially between the buttocks, and kept so throughout the healing if the best results are to be obtained. Although the powder gradually becomes moist, it gives excellent protection to the skin, is mildly antiseptic, and sheds water to an amazing degree. With reasonable care it is usually possible to maintain absolute dryness.

If, as occasionally happens, there is considerable tendency to moisture and maceration of the skin, the application of a 10% aqueous solution of ichthylol before dusting with the powder will be found effective.

The patient, free from any dressing, lies upon a small pad which collects any discharge from the vagina or elsewhere, and can be changed whenever necessary. The genitals are carefully washed after urination and defecation, and as often as may otherwise seem necessary.

The advantages claimed for this method of treatment are dryness of the parts and so less tendency to irritation and infection. There is also no perineal dressing to increase perspiration, absorb discharges and form a poultice.

Although applicable to all cases, it is especially advantageous where the buttocks are closely opposed, as in the obese, and the secretions of the wound and skin tend to collect between the buttocks.

Many patients can even urinate without contaminating the wound, and the remains of vaginal douches run harmlessly over the surface of the powder when it has been carefully and properly applied. If the parts become soiled, washing, drying and re-powdering leaves everything as before.

In addition to the strictly surgical advantages just mentioned, patients are made more comfortable, both by the lessened irritation of the skin as well as by the absence of a dressing to catch and pull upon the sutures.

The success of this treatment has been amply demonstrated as regards the comfort of the patient and the end results. As a simple method, it may commend itself to surgeons, and possibly to hospitals, as affording an opportunity to save in the cost of dressings.

Clinical Department.

AN UNUSUAL EXOSTOSIS OF THE SCAPULA.

BY LLOYD T. BROWN, M.D., F.A.C.S., BOSTON.

AN unusual case of exostosis of the scapula was found at operation. A search of the literature revealed no similar condition, although a few cases of exostosis in other parts of the scapula were mentioned. This case is therefore reported as of possible interest. The specimen can be seen at the Warren Museum of the Harvard Medical School.

The history was of a girl, sixteen years of age, who came for examination because of a prominent shoulder on the right side. This condition had been present more or less for two or three years, but had apparently been more noticeable and more painful for a few weeks before examination. The pain was present only when the shoulder was used; not present when lying down; was worse when writing, playing the piano, etc. Her general health had always been considered good. Since the increase of pain she had suffered with many headaches and had been much more nervous and irritable. Physical examination showed a well-developed girl, standing with the shoulders drooped, with a marked prominence posteriorly of the right shoulder. There was marked crepitation on movements of the right scapula over the ribs. The scapula at times in sliding over ribs would catch and jump from one rib to another. This was associated with pain. Crepitation and pain were entirely absent when the shoulder was forward. The left scapula was only slightly flexed at the upper angle and showed no symptoms. The diagnosis was either a sharply flexed scapula or an exostosis. There had been no history of injury to the right shoulder. One and one-half years after the patient was first seen, since there had been no improvement with corrective exercises and braces, etc., an operation was performed. A curved incision following the line of a low neck dress was made over the right scapula. The upper angle of the scapula was exposed, the fascia of the trapezius muscle was split and retracted and the upper angle of the scapula after being freed of its muscular attachments was removed with bone cutting forceps on a line parallel to the spine. The opening of the fascia was closed with silk and the skin sutured with silk worm gut. The patient made an uninterrupted recovery, not having had a great deal of pain, the wound healing with primary union. Five months after operation the patient reported herself perfectly well as far as the shoulder was concerned.

The fragment of the upper angle of the scapula showed that it had evidently been attached to the rest of the bone at an angle the reverse of the slight forward flexion which is usually present. (See Fig. 1). In other words, it was bent backward. From the anterior surface of this fragment there was a hook-like process of bone growing out at right angles. (See Figs. 1 and 2).

This process was entirely surrounded by part of the attachment of the subscapularis muscle. It was a little over 3 cm. in length. Its upper border at the base was about 5 mm. below the tip of the superior

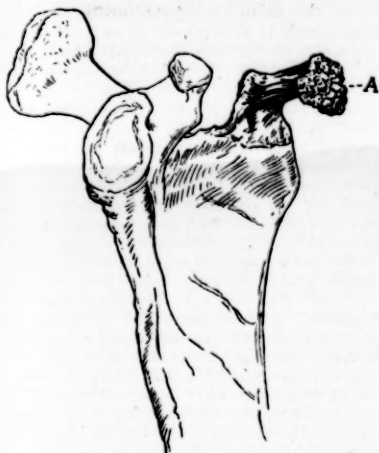


FIG. 1.

Shows the exostosis A of the upper angle of the scapula as found at operation and its probable relation to the rest of the bone. Note that the upper angle is bent in a posterior direction so that the normal slightly-flexed position is reversed.



FIG. 2.

Another view of the same.

angle or supraspinata of the scapula and projected anteriorly at an angle of 90° to this. The base of the process conformed to the triangular shape of this portion of the scapula. The end of the process in outline was also triangular, and was rounded with the convexity forward. The convex end was sharply defined from the shaft. It was covered with a white, glistening cartilage-like material and was somewhat irregular on its surface. There was probably a bursa over the end of this bone. The shaft of the process in cross section was roughly triangular and was much smaller at its middle than at either end.

The specimen was shown to the late Dr. Charles Minot, who considered it to be an exostosis, because he knew of no possible congenital origin for such a condition.

This specimen was not examined microscopically, but to all who examined it macroscopically it did not seem to be akin to the bone tumors. It seemed to be an exostosis, although there was no history of injury which might have been an etiological factor. There is record of one other similar case operated upon by Dr. Goldthwait at the Massachusetts General Hospital.

The history of this case was that of a girl, age twenty, who was admitted to the Medical Wards in 1903 for abdominal pain and headaches. In 1905 she was admitted surgically for duodenal ulcer and hemorrhoids, from which service she was transferred to the medical side for gastric neurosis. She complained of pain in the epigastrium and in the back between the shoulders. In January, 1906, she was admitted again because of dull, constant pain in the back referred to the left scapula region. This had been increasing in severity and was interfering with sleep and was preventing work.

Physical examination at this time showed that the motions of the arm and shoulder were free and painless. There was no swelling or inflammation. Slight crepitus was felt when the examining hand was placed on the scapula while the latter was in motion. An operation was performed and the upper angle of the scapula was dissected free and was removed. A sharp hook-like exostosis was found at the upper angle of the scapula which projected forward and rubbed against the chest wall.

Six weeks later the patient returned to the hospital with no pain in the operated shoulder but was having pain on the other side. This side was operated upon and the superior angle of the scapula removed. There was no exostosis present.

In the past eleven years at the Massachusetts General Hospital there have been four cases of exostosis of the scapula but these have all been below the spine, on the posterior or anterior surface, or on the vertebral border.

McWilliams in the *Journal of the American Medical Association*, October, 1914, reports a case of subscapular exostosis. The exostosis was in the lower part of the body and there was definite history of injury.

The question of enchondroma of the scapula has not been discussed in this paper.

These two cases of exostosis of the anterior surface of the superior angle of the scapula are reported because no similar ones were found in the literature.

They are interesting not only because of the unusual place at which the exostosis occurred, but because they were both associated with symptoms of a nervous character which were equally, if not more, distressing than those due to the bone condition found at operation. With the removal of the bony obstruction which had caused a change in the normal position of the shoulder it was possible for the whole body to take on a more normal function with a consequent im-

provement in the general condition. I wish to thank Dr. Goldthwait for permission to report this case.

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Medical Progress.

TENTH REPORT OF PROGRESS IN ORTHOPÆDIC SURGERY.*

By ROBERT B. OSGOOD, M.D., ROBERT SOUTTER, M.D.,
 C. HERMANN BUCHHOLZ, M.D., HARRY C. LOW, M.D.,
 MURRAY S. DANFORTH, M.D., BOSTON.

(Continued from page 621.)

SCOLIOSIS.

Wolff⁵¹ seems to be quite enthusiastic about Abbott's method. He has given up the exercise treatment in severe scoliosis, as he thinks it has only a temporary influence upon such cases. Wolff has used Abbott's method in a number of cases and describes in detail the preparation of the patient, which he considers important. The spine is mobilized for two weeks by baking; the skin stimulated by rubbing with alcohol. The patient is accustomed every day to the position to be assumed in the Abbott cast. One or two days before the cast is put on, the patient remains in bed and is prepared as if he were to undergo an operation. The bowels are kept empty and no food is given immediately before applying the cast. Wolff thinks that some of the accidents which have occurred may be explained by the filling of the stomach too full before the cast is applied. Besides the usual apparatus, Wolff uses wide strips of adhesive plaster which are finally fastened to the plaster cast through the windows. The flexion of the spine ought not to be exaggerated too much. Wolff knows of no method which obtains such a correction and mobilization in so short a time. He has seen cases where the effect was more conspicuous after six weeks of wearing Abbott's jacket than by exercises done for several years. The height was increased in nearly all his cases, sometimes as much as 5 cm. Wolff has examined his cases 6 to 12 months after the end of the treatment, and he has not seen any severe recurrence, though some of them have lost a part

of the correction. For the after-treatment Wolff uses a regular Hessian corset and for the night a plaster bed in an over-corrected position.

Lovett⁵² still persists in the original method which he has used so long because he believes that in this position the thorax has a greater fixation upon the vertebral column than in the Abbott position, and also that the lateral and rotation pressure upon the thorax is, in his position, more likely to be effective for the spine than for the thorax alone. Over-correction is not generally obtained by his method, but there is a distinct improvement in all cases. All the cases that he reports are now out of corrective jackets and in retentive braces with exercises.

Stock⁵³ still holds to the belief that faulty positions long maintained are often the causal factors of scoliosis among school children. He advises shortening the duration of lectures and the establishment of intermissions for exercises in the open air in addition to one hour of definite gymnastic work. The lighting of the desks, he thinks, often leads the child to sit in a strained, unnatural position. He believes that the teacher should pay special attention to the poise of the children and have their posture constantly in mind. Most of these scolioses show improvement without other treatment than the correction of the position, some of them entirely disappear, and only 10% show a progressive character.

Strunsky,⁵⁴ in an article on "Neglected Lateral Curvature," maintains that these deformities are serious and widespread. They cause no premonitory symptoms, and in this respect are unlike tuberculosis. The deviation is frequently discovered first by the teacher, the dressmaker, or the mother. Strunsky thinks that competent orthopedic examination of school children would detect incipient cases or even those with tendencies, and urges more general orthopedic observation in schools.

(Ed. Note.—Goldthwait and the Boston School of Physical Education have been carrying out such supervision and training in posture in one large private school in this city, and at the request of the respective school committees, have assumed the direction of these important preventive and hygienic matters in all the public schools in one considerable city and two large towns. The plan is roughly: (1) Orthopedic medical direction; (2) Supervision by a person trained in postural principles and corrective work, e.g., the head of a normal school of gymnastics. (3) Detailed work with the teachers and pupils by last year students specially taught for this work, who make weekly or bi-weekly visits to the different schools. It is perhaps too early to determine the complete result of this progressive experiment, but thus far (2 years) it is most hopefully successful from an orthopedic point of view and there has been widespread and unexpectedly favorable comment from the teacher and parents, which encourages the continuance and further extension of the plan.)

* This report is based on a review of 440 articles selected from about 900 titles having to do with orthopedic surgery, appearing between Nov. 1, 1914 and Jan. 1, 1916. References are given to only such articles as have been selected for note and comment.

DISLOCATIONS AND FRACTURES.

Subglenoid Dislocation of Humerus.

Sebastian⁵⁵ reports three cases of subglenoid dislocation of the humerus which were unusual in that they were all produced by falls upon the tip of the shoulder, instead of by the more classical forcible abduction of the arm. Their reduction presented no difficulties under ether narcosis.

Fractures of Carpal Scaphoid.

Biedermann⁵⁶ has studied eleven cases of fracture of the carpal scaphoid appearing at Lexer's out-patient clinic in Jena during 1913. When the diagnosis was made early and conservative treatment administered, the results were good, four obtaining perfect function, and three showing only slight limitation of dorsal flexion. In the three cases which came to the clinic several months after the injury, which had not been recognized, more or less limitation of motion was present. Two of these were much improved by operation. In one of these cases the badly altered bone was totally resected and the hole filled with fat, and in the other the softened portion was scraped away and the cavity filled with iodoform wax. In the third old case conservative treatment was followed and "improvement" is reported.

Supracondylar Fracture of the Humerus.

Lusk⁵⁷ believes that a perfect result in these supracondylar fractures of the humerus is prevented by the projection forward of the upper fragment, and the subsequent interference with flexion, which is caused by the callus thrown out at this point. Reduction is not always easy. The posterior periosteum is often not torn across and if this is recognized it may be used as a band in guiding the fragments into apposition. The first movement in reduction should be hyperextension downward; the traction on the forearm allows the lower fragment to be pushed forward and the posterior alignment corrected. The second procedure is pressing forward on the olecranon and backward on the upper fragment of the humerus. The third and last movement is quick flexion of the elbow while the above pressure is being maintained. The arm is immobilized in acute flexion, a pad of gauze pressing back the lower end of the upper fragment.

(Ed. Note.—Lusk's observations on this particular fracture are in accordance with those of Robert Jones, whose axiom is "that all fractures of the elbow, with the single exception of fracture of the olecranon process, should be put up in acute flexion." While there may be other equally good methods of retaining certain of the elbow fractures, the rule is extremely helpful and the value of the position needs to be emphasized, not only as a method of maintaining correct alignment, but also as a means of prevention of future stiffness and of favoring future function. Extension of the elbow is a vastly easier motion to regain than flexion, being in the direction of gravity, and flexion a little more

acute than a right angle is in most cases a better position of permanent stiffness than extension or flexion at a little more obtuse angle than a right angle.)

Fractured Ribs.

Gross⁵⁸ uses the ordinary adhesive plaster in overlapping strips at the site of fracture, but in addition carries a strap over the opposite shoulder. This extra strap enables the patient to walk with much less discomfort.

Cotton⁵⁹ has always been impressed with the idea that non-impacted hip fractures do badly while the impacted unite well. "Then why not impact loose fractures artificially?" Hip fractures are either extra- or intracapsular. If intracapsular, they are either impacted or they are not, and the extracapsular fractures show no tendency to failure of union. The intracapsular fractures, unless they are impacted, often result in non-union. Cotton has not found the expectant treatment unsatisfactory, and after a study of a series of cases treated systematically by direct traction, he has realized that the results were poor. Whitman's method of abduction and readjustment of the fragments often fails through lack of the expert care that is necessary. Cotton's method is a modification of Whitman's, and though perhaps not as scientific, at least seems to be practical. Under moderate anesthesia he pulls the loose fracture into place, then padding the trochanter heavily with felt, he strikes upon it with a heavy wooden mallet with carefully directed blows. As this is done one feels the impaction at the neck and the head, and the free outward rolling motion disappears. The amount of force needed is not great, and the heavy mallet is used in order to get a sufficient impact from a slow and well-controlled swing. The leg is put up in moderate abduction. In no case has any harm resulted. In a number of cases Cotton has in this way obtained impaction of extracapsular fractures, though as yet his results have not been sufficiently proved by the test of time.

Fractures of the Transverse Processes of the Spine.

Stemmler⁶⁰ reports two cases of fracture of the transverse processes of the lumbar spine. The characteristic symptom is the limitation of motion and pain in bending the body laterally towards the well side. There is also pain in forward bending and in straightening and there is local tenderness, but these symptoms may also be present in simple haematoma of the muscles and other conditions. The Roentgen rays offer the only certain method of diagnosis.

Local Congestion in Fractures.

Sprengel⁶¹ in three cases of delayed union in fractures of the lower leg has employed local passive congestion in the following manner. Fairly snug plaster casts were applied and a window cut in the cast over the point of fracture. Several times during the day the patient hung the leg down until a considerable conges-

tion and oedema occurred. The results were most favorable and encouraging.

(Ed. Note.—It seems not impossible if these results should be confirmed that union might be accelerated in fresh fractures by carrying out these methods. The necessity for a careful supervision is at once apparent.)

BONE AND JOINT SURGERY.

Miyauchi⁶² has come to the conclusion that autoplasmic transplanted bone marrow is capable of forming new bone. Its specific myeloid cellular elements remain partly living and represent the cellular trunk from which the regeneration of the bone marrow at least partly proceeds. On the other hand, it has been proven that a considerable part of the young marrow is formed by haematopoietic renaissance. The author could not decide whether these new formations of blood cells take place from the endothelium of the vessels or from the cells of the adventitia.

Davis and Hunnicutt⁶³ as a result of their study, concluded that the free periosteal transplant did not produce bone in most cases, nor did pedunculated flaps of the periosteum. However, when there were attached to these flaps bone chips a new bone was reproduced. A removal of the periosteum seems to have little, if any, effect on the nutrition of the bone. After a subperiosteal resection of a portion of a bone the growth of the bone is not impaired. The new growth was from the bone stump, the periosteum acting simply as a limiting membrane. "*Flexed Scapulae.*"

Marshall⁶⁴ has reported the late results in 11 cases of forward flexion of the upper angle of the scapula upon whom Goldthwait's operation of removal of the tip of this angle had been performed in the orthopaedic clinic of the Massachusetts General Hospital. In eight cases carefully followed for a long period, the results were most satisfactory as to relief of pain and ability to use the arms without symptoms. In one of the cases, a young neurotic girl upon whom Marshall thinks the operation should not have been performed, there was no appreciable change for better or worse. In the two remaining cases there had been improvement when they were last seen a few weeks or months after the operation, but he was unable to follow them. He concludes that long continued painful symptoms of localized tenderness and crepitation are sufficient indications for operation, and that there are some extremely acute cases of short duration which should also be operated upon. Marshall does not advise the operation in younger patients with mild symptoms. The diagnosis of the condition is made from the curved deformity of the scapula and by the definite tenderness at the upper angle, which is exaggerated by the shrugging of the shoulders. All of the cases show varying degrees of "round shoulders," and treatment of the "posture" should supplement the operation.

Treatment of Cavities After Bone Operations.

Bayer⁶⁵ thinks that the simplest way of filling bone cavities after operations is to trim the edges of the bone forming the cavity, so that a small and uniform trough will result, and then to fold in the periosteum and skin. The soft tissues are pushed in by a roll of gauze to exert pressure on the skin, and this also aids in hemostasis. The periosteum rapidly forms new bone to fill in the cavity.

Misapplied Bone Surgery.

Wilson,⁶⁶ although speaking especially of conditions in Philadelphia, seems to think that the orthopaedic surgeon is too often inclined to operate upon bones. Owing to the development of operative technique and new special operations in bone surgery, there has been in the past few years a great stimulus in this direction. Doubt in diagnosis does not usually justify exploratory operation, because with the exactness of our x-ray and other methods in determining the character of the disease, it is not often that the orthopaedic surgeon need be in doubt as to the diagnosis. The newer operative methods have been enthusiastically followed by some with the idea that they would shorten the course of the chronic disease. Wilson does not wholly accept this view. The mechanical appeal in the application of bone grafts to surgeons who have long used the mechanical brace for supportive treatment is strong, and is in danger of influencing the judgment of the surgeon. This judgment as to the wisest treatment should never lose sight of the nature of the pathological process. Lorenz formerly advocated ankylosis as the best method of curing tuberculosis. There are still those, however, who feel that it is not impossible in tuberculous disease of the joints to obtain a result in which there is fair function with a moderate degree of motion and no pain. There are surely early cases of tuberculosis of the spine in which the protective treatment carefully followed for several years results in an ankylosis which effects only two or three vertebrae. In these cases the bone graft successfully applied would cause an ankylosis of four or five vertebrae. The time saved by the operation would not be a large factor. Wilson believes that "bone transplants or other operations for securing ankylosis are not applicable to early stages of bone tuberculosis when the functional recovery may be obtained with the control of the pathological process."

Injury to the Crucial Ligaments of the Knee.

Morian⁶⁷ in one year has seen five cases of injury to the crucial ligaments. There are said to be only 31 reported cases. In all Morian's cases a piece of bone had been torn off by the anterior ligament, in two cases from the femur, in three from the tibia. The injury was caused by the weight of the body or some other extraneous force being exerted on a partly flexed knee joint in the direction from without inward, a simultaneous inward twist occurring in four cases and an outward twist in the fifth. In only a few reported cases has the force been exerted

from within outward. The symptom of increased antero posterior mobility was wanting in Morian's cases, for in none was the anterior ligament entirely torn away. The x-ray revealed the condition. Two of the cases presented symptoms resembling "joint mice" with a more or less chronic hydrops.

(Ed. Note.—Our experience leads us to believe that injuries to the crucial ligaments are more common than have been supposed. Within the past year five cases have been seen in the orthopaedic clinic of the Massachusetts General Hospital, not all diagnosed before, but all confirmed at operation. Brackett has had two more private cases confirmed by operation. The exposure of the knee joint by a long vertical incision splitting the patella makes possible the inspection of these ligaments. The anterior, as Morian says, is frequently only partly torn and often may be repaired or the tab with its small bit of torn-off bone removed, and the "catching" thereby relieved. The posterior ligament, fortunately apparently rarely torn, is most difficult to reach.)

Transplantation of the Whole Knee Joint.

Deutschländer⁶⁸ reports a case of homoplastic transplantation of the whole knee joint, including capsule, ligamentous apparatus, and patella. The result was not encouraging and consisted in a slightly mobile pseudoarthrosis.

Fascia Lata used to Reinforce Suture of Patella.

By the use of a free flap of fascia on the sutured patella, Seubert⁶⁹ has obtained excellent results. He began massage and exercise of the thigh on the third day, and on the tenth day careful motions of the knee joint. Two weeks after the operation the patient was allowed to be up. After five weeks he was able to go up and down stairs without any trouble, and the movements of the knee joint were nearly normal.

Payr⁷⁰ reports with pride that two cavalry officers have gone through the campaign to date without the least disturbances from the knee which he had previously operated on. He had mobilized the totally stiff joints and introduced a pad of fascia and fat. This has restored practically normal function to the joint even through the stress of the active campaign which he records as the severest test of arthroplasties that can be imagined.

POSTURE, BODY FORM, ETC.

Care of the Abdomen in Infancy and Childhood.

Mosher⁷¹ discusses the care of the abdomen and the development of the abdominal muscles during infancy and childhood. During the first six months there being no question of posture, there should be provided a firm, flat place to lie upon rather than a bumping carriage. During the next six months the abdominal muscles begin to gain in strength as the child learns to sit and then to stand. In the following year of play Mosher thinks that two things are of much importance: (1) the sleeping without a pillow, and (2) the assumption during a part of the rest

time of the ventral position. Too much sitting on the floor should be avoided.

The Mechanically Unfit.

Swaim⁷² has studied the types of body form in 3000 sanitarium cases, all of whom were more or less chronic invalids, and found that of this number only very few could be considered posturally normal. As types of body form Swaim takes Treves' classification of the so-called herbivorous class, the intermediate, and the carnivorous class. The carnivorous corresponds to the congenital visceroptotic type of Goldthwait, and he finds that by far the greater proportion of sanitarium patients are of this type.

(Ed. Note.—This study seems to us of special significance. Visceroptosis and faulty posture often exist in individuals who are active in body and mind, but if we should find, as Swaim's investigations suggest, that our general sanitarium patients nearly all show these conditions, and that our groups of tuberculous cases present similar pictures, and that disturbed kidney function is often associated with faulty posture, we would seem to be gradually accumulating evidence that orthopaedic attention to these anatomic facts is of more than cosmetic value and is of vital importance to the health of the human race.)

Lordotic Albuminuria.

Fischl and Popper⁷³ have made a careful and exhaustive study of a number of patients showing this condition and have carried out special tests on two cases; they have been unable, however, to come to any definite conclusion as to its exact cause. The condition appeared in the strong and well-developed as well as in the weak and anemic types. The two cases especially observed were one of each type. It is comparatively rare, many lordotic individuals showing no trace of albuminuria. The authors are inclined to believe that the explanation is to be found in a mechanical cause, resulting in congestion of the renal vessels, together with a local and general predisposition. A support of the Hessing-Neider type has been successful in treating the conditions by improving the posture.

Significance of Pain in Lower Back and Legs from an Orthopaedic Standpoint.

Silver⁷⁴ while admitting that the orthopaedic surgeon often pays too little attention to abdominal conditions, which owing to the nerve reflexes may give rise to pain in the lower back and legs, feels that the general practitioner still more often neglects a consideration of the osseous, ligamentous, and muscular abnormalities which may give rise to these same symptoms. Silver recognizes the importance and the frequent occurrence of tuberculosis and other infectious processes in the spine, but believes special attention should be given to the question of statics and posture in relation to pain. Defective attitudes are assumed not only in standing, but in sitting and lying, and in accordance with the requirements of various occupations. The sacrum, he maintains, is not really a keystone,

but must be considered as suspended from the iliac bones by strong posterior ligaments. In the upright position it is likely to be a much more unstable joint than the hip or the knee, owing to the vertical plane of its articular surfaces. The author admits that the diagnosis of sacro-iliac relaxation is "overworked," but maintains that these relaxations do often occur. We know that gradual compensatory sacro-lumbar and sacro-iliac relaxations take place in ankylosis of the hip, and why should they not in cases of severe repeated conditions of strain or traumatism? If perfect fixation is to be obtained, Silver uses a cast from ankle to axilla. Muscle training, rather than muscle building, is the method of cure.

(To be continued.)

Harvard Medical School.

MEDICAL MEETING.

IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL, ON TUESDAY EVENING, APRIL 18TH, AT 8.15 O'CLOCK.

DR. HENRY A. CHRISTIAN, president, in the chair.

Paper of Professor W. T. Councilman: Ochronosis and Alkaptonuria.

The specimens which I wish to demonstrate this evening are from a man of 68 years, who was a patient of Dr. Ogden of Milwaukee. He was first seen by Dr. Ogden thirty-five years ago on the occasion of an examination for life insurance. The urine at that time was black. In other respects, however, the man appeared to be in perfect health.

During the last few years of the patient's life (he died in 1914) he was to a large extent incapacitated, due to the arthritic condition of his joints. He had been a great walker throughout his earlier years and this confinement was necessarily an extreme hardship.

The specimens which you see show the intense black color of the joint cartilages. The erosions and irregularities of the joint surfaces amply explain the clinical features of arthritis.

(Dr. Councilman read extracts from the report of this case, which will be published under the names of Ogden and Boretta.)

The recognition of ochronosis dates back to 1866. It was first described by Virchow in the *Archives* which bear his name, volume 37. Homogentisic acid which gives to alkaptonuric urine its peculiar properties was discovered by Marshall; but it remained for Wolkow and Baumann to isolate it from a case of alkaptonuria. This was in 1891. It was not until 1902 that the relationship was pointed out by Albrecht between alkaptonuria and ochronosis. A pigmentation of the cartilage was found in all of the older cases of the latter disease. There are now some 10 cases of ochronosis reported which are attributed to the prolonged external use of weak carbolic acid. The youngest individual reported as

having ochronosis was 31 years of age. Alkaptonuria, on the other hand, occurs frequently in early life. This condition is probably congenital in all cases. It is hereditary and there is evidence to show that it occurs rather more frequently as a result of the marriage of cousins.

The pigment was supposed by Virchow to be an iron pigment derived from the blood. A more careful investigation, however, has shown that it is very closely related to melanin. It appears likely that it is formed by the action of a ferment tyrosinase or tyrosine. Such a ferment has been isolated from cartilage.

The deposition of pigment has varied in different cases. It may be found in any of the cartilages of the body, but is rather more frequently encountered in that of the femur. It has been discovered in the lining of the aorta and in the sclerae.

(Lantern slides of the case were shown).

Paper of Dr. S. C. Harvey: The Use of Fibrin Paper and Forms in Surgery.

A great amount of work has been done in the attempt to secure means of controlling hemorrhage. Two types of bleeding are encountered surgically. The first is seen in patients who are hemophiliacs or who are suffering from icterus. In the second, the hemorrhage results from parenchymatous injuries, from operative trauma to delicate structures such as the pia-mater, and so on.

The methods which have been used to combat these forms of hemorrhage are likewise of two types. Kephalin and the Koche-Fonio coagulens are examples of the one type which depends upon chemical means to decrease the coagulation time of the blood. One objection holds true for all these substances. To apply solutions of this nature, some form of tampon is necessary, and in the removal of the latter, the clots are dragged from the hemorrhagic areas leading to secondary bleeding.

Experiences of this sort led to the use of hemostatic agents of a second type. These include various tissues such as muscle, fascia and fat. Bits of muscle have been used successfully for this purpose by Sir Victor Horsley and Dr. Cushing for many years.

Last year Dr. Grey undertook to find an absorbable substance which might be used in place of muscle. He has shown that fibrin from human or animal blood may be satisfactorily employed for this purpose. It can be sterilized and it is readily absorbed by the tissues.

Fibrin in its natural state, however, has certain disadvantages. These I have attempted to overcome. By using a process somewhat similar to that employed in the manufacture of paper, I have prepared a fibrin paper. This enables the operator to secure hemostasis with a minimum amount of the material. After grinding up the fibrin it is suspended in water and then thrown down on a fine-meshed strainer. Great pressure is now exerted on it, converting the film into a thin flexible sheet. It is then autoclaved for 15 to 30 minutes. When moist this substance has considerable strength. It is partly translucent and slightly elastic. On drying it becomes hard and brittle.

The thinner sheets control bleeding quite efficiently. A further refinement consists of cutting sections from a block of fibrin with the microtome. Material of this nature has been used successfully for several months by Dr. Cushing in his cerebral

surgery. Thin sheets are absorbed in animal in about two weeks. Sections cut at 40 micra are absorbed in seven or eight days. The same process that is noted in the repair of wounds is found in the absorption of the films of fibrin, except that toward the end of the reaction in the latter there is some giant-cell formation, showing that the fibrin acts slightly like a foreign body.

The second use to which fibrin has been put has been in the end to end anastomosis of the intestines according to the method of Halsted—the so-called bulkhead suture method. Dr. Halsted some time ago devised this technique in order to make such an anastomosis a strictly aseptic procedure. He used cones of candy and of paper.

Dr. Fleming suggested the need of some absorbable substance which would better answer the requirements of this bulkhead suture operation. We devised cones of fibrin paper which have proven to be very satisfactory. The fibrin forms are sufficiently stiff to enable the operator to carry out all of the necessary steps of the operation. They soften, however, within an hour or so and are easily handled by the intestine. Within ten to twenty hours complete digestion occurs (in the upper intestine). The operation has now been successfully performed on a number of dogs.

Paper of Dr. Henry A. Christian: Renal Function in Pernicious Anemia.

Pernicious anemia presents the interesting condition of a patient whose blood is reduced far below the normal. One would naturally assume that such a change would have an effect on many of the viscera.

Dr. Du Bois, who recently addressed this society, found from his respiratory studies that the metabolism in this type of disease is considerably above normal. In this clinic Drs. Peabody and Wentworth have discovered practically no change in the vital capacity of the lungs.

We know that the function of the stomach is very definitely interfered with, an anacidity usually being found in such patients. The total acidity is likewise much below the normal. When the blood shows a return to near the normal number of red cells the gastric function still remains impaired. This has suggested that there is probably some connection between the anacidity and the primary cause of the disease.

We have been studying the function of the kidneys in this class of cases. The phenolphthalein test has shown nothing remarkable. Even in the severer cases there is practically a normal phthalein output.

Our interest has chiefly been centred on the dietary functional tests. If we test the urine in normal subjects at two hour intervals when they receive about three meals a day, we observe distinct variations in the renal function. With an increased amount of protein consumption there is usually also an increased sodium chloride and purin intake. The latter act as diuretic agents. This accounts in part for the fluctuations in amount of the urine throughout the day. Where the urinary output is large in amount, furthermore, the specific gravity is usually lowered. From the variations brought about in this way we obtain figures, which when plotted on paper, give us an up and down curve, the so-called picket-fence curve. There are normal curves of this type for the specific gravity, the sodium chloride excre-

tion, the nitrogen-output, the quantity of the urine, etc.

When the kidneys are diseased they lose their ability to vary the specific gravity and the output of the various constituents of the urine. As a result the curves show smaller variations and tend more to approach straight lines.

A number of cases of pernicious anemia studied in this manner have afforded us some interesting findings.

(Lantern slide demonstration of charts).

The specific gravity curves are almost flat lines. The nitrogen-output curves also show some flattening. While the phthalein excretion is normal, and the urines show only an occasional cast and a trace of albumen, the curves reveal a functional disturbance quite similar to what we get in chronic nephritis. Such curves are fairly constant from day to day though the actual amounts of urine secreted may vary.

Following transfusion the curves again become slightly more irregular in outline. Just what the nature is of this functional disturbance is at present unknown. It is not of a circulatory nature, a chronic passive congestion, for the hearts are not materially affected. Pathologically, the kidneys do not ordinarily show a nephritis. As a rule, furthermore, such patients do not have arteriosclerosis to any marked extent. Certainly there is no parallelism between the arteriosclerotic changes and the results of the functional tests.

It might appear at first sight as though there were some relation between the therapy used and the curves, since it has been shown that arsenic will cause an acute nephritis in animals. Only certain of our patients, however, have received arsenic or salvarsan.

The most likely conclusion is that this functional disturbance of the kidney is in some way related to the anemia. We have used different forms of treatment in our patients,—splenectomy, arsenic, salvarsan, transfusion, etc., so that we are having an opportunity to study the effects of the different therapeutic measures on the curves of renal function.

ERNEST G. GREY, M.D.

PANG SUEY BILL KILLED.—By a roll call vote of 129 to 94, the House rejected the so-called Pang Suey bill to permit the gratuitous prescription of natural herbs. This action was taken after a debate lasting more than one hour. In favor of the measure it was stated that only six persons in the state would practise under the bill, and that two thousand persons were waiting to take the "natural herb" treatment. One speaker, in urging the passage of the bill, said that the Chinese doctor in question holds the highest medical degree given in China, and that we cannot scoff at the results of a civilization far more antique than ours. This view is certainly broad-minded; it is well enough to acknowledge our debt to antiquity, but credulity such as this, especially in view of the recent reports on medical education in China, shows a lack of discrimination in the true value of things.

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ERNEST GREGORY, Manager,

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THE PROBLEM OF THE FEEBLE-MINDED.

EVERYONE has known, at sometime or other, a feeble-minded person. In large cities, unfortunately of this type usually settle down to the bottom of the social mixture. In the country, they lead rather better lives. Their fellow-townsmen become accustomed to their eccentricities, and often employ them for simple kinds of work. In the city, where competition is keener and each man's responsibility for his neighbor is less, they do not fare so well. As tools of unscrupulous, cleverer people, they frequently become offenders against the law—a fate which is really a blessing in disguise if they are recognized as feeble-minded, and are sent to one of the schools for mental defectives.

Unfortunately, the schools at Waverley and Wrentham now provided by the state for this purpose are crowded, with waiting lists of 400

applications at Waverley and 456 at Wrentham. Approximately 2000 feeble-minded can always be found in other public institutions. According to the League for Preventive Work, which represents some 20 charitable associations of Boston, there are about 15,000 mental defectives in Massachusetts.

The Massachusetts Legislature of 1915 made an appropriation of \$50,000 for the purchase of land for the establishment of a third school. A tract of 880 acres of farm land has been purchased in Belchertown, and now bills are before the Legislature calling for an appropriation of \$150,000 annually over a period of five years, for the construction of buildings suitable to house one thousand inmates.

It is difficult to see what arguments can be raised against such an expenditure. Not only will crime and immorality of the most bestial type be decreased by the segregation of these one thousand feeble-minded, but the poor unfortunates themselves will be enabled to live comfortably, with simple work, plenty of food and decent surroundings. The expenditure will be a good investment, for the cost per capita is less in an institution such as is contemplated than in the almshouses, jails and hospitals in which many of the mentally defective are now supported. The greatest argument of all in favor of the bill is that segregation of these people will prevent them from perpetuating their kind. Breeding, as they do, nearly twice as many children as do normal individuals, their menace increases steadily year by year. An enlightened state will safeguard its future by such measures as the building of a new school at Belchertown.

NEW AND NON-OFFICIAL REMEDIES.

THE recently published 1916 edition of "New and Non-Official Remedies," issued by the Council on Pharmacy and Chemistry of the American Medical Association, is the latest output of a work, whose value, scope and character are, perhaps, as yet not fully appreciated by the profession. The volume is unpretentious, the contents conservative and unsensational, so that a hasty and superficial examination does not reveal its real merit.

"New and Non-Official Remedies" is the only source of authoritative information for practitioners about the newer remedies of whose value.

often considerable, judgment should not be made solely from commercial statements. The Council on Pharmacy and Chemistry is composed of chemists, pharmacists, pharmacologists and clinicians of the highest standing in this country and is affiliated with corresponding members in Germany and England. Indeed it is recognized internationally as an authority on the newer remedies.

Moreover, "New and Non-Official Remedies" supplies practitioners with a large amount of useful information about the comparative action, toxicity, dosage and reliable sources of supply of many drugs and preparations. *

This volume, then, is both authoritative and educational, and is a worthy contribution by the American Medical Association to the cause of therapeutic reform.

A CHRISTIAN SCIENCE CONSPIRACY.

REPORT from Washington, D. C., states that on April 11th Senator Works of California, who is described in "Who's Who" as a Christian Scientist, initiated a movement to cause the resignation of Surgeon-General Rupert Blue of the United States Public Health Service as President of the American Medical Association, by introducing a joint resolution which he asks should be referred to the committee on public health. This resolution was as follows:

"Whereas, the American Medical Association is a national organization of physicians and surgeons of one school of medicine only and intended to advance the personal and private interests of its members; and

"Whereas, one of the objects of said association actively and aggressively prosecuted is to procure legislation, state and national, in the interest of the school of medicine represented by it and against all others; and

"Whereas, the Public Health Service of the United States is intended to represent all classes of people of all medical or non-medical beliefs in national and interstate affairs; and

"Whereas, the surgeon-general of the Public Health Service has been elected president of the said association and other officers of the service have become members thereof; and

"Whereas, it is believed that the best interests of the Public Health Service and of the people require that its officials and employees be free from influence or control by any school of medicine, or mode of healing;

"Now, therefore, resolved:

"That it shall be unlawful for any officer or employee of the Public Health Service of the government to be or become a member or officer of, or in any way connected with any medical or private health association or organization of any kind."

It is believed that this resolution, the effect of which would be not only to cause the resignation of Dr. Blue, but to prevent all members of the Public Health Service from belonging to any civilian medical society, had its genesis in the recent action of Dr. Blue in advocacy of two bills now before the committee on public health for the addition to the Public Health Service of two new bureaus on rural sanitation and on mental hygiene. Senator Works, who is a member of this committee, has objected to these bills on the ground that the Public Health Service has exceeded its constitutional authority in attempting certain enterprises which he believes belong within the provinces of the state governments.

PROPOSED REORGANIZATION OF STATE BOARD OF INSANITY.

THE special committee on commissions of the Massachusetts General Court, reported on April 11th, a bill for the reorganization of the State Board of Insanity. This bill abolishes the present board of three paid members and substitutes therefor a bureau of insanity, consisting of a director, who shall receive a salary of not more than \$7,500, and who shall be a physician, and four unpaid members, two of whom shall be physicians. All the members are to be named by the Governor subject to confirmation by the Council, each member to hold office for a term of five years.

Another section of the bill restores to the boards of trustees of the various institutions under the jurisdiction of the bureau of insanity the powers which they enjoyed prior to the reorganization of the State Board of Insanity only two years ago. This section further provides, however, that the Governor may at any time request the proposed bureau to assume management of any of the institutions in case he considers such procedure advisable.

Senator Hayes, chairman of the committee on commissions, with three other members of the committee, is recorded as in dissent to the report favoring this bill and announces that he will offer a substitute bill for an unpaid board of five

members to consist of the three present members, and of two more to be appointed by the Governor.

It is unfortunate that the subject of further reorganization of the State Board of Insanity must be again raised so soon after its recent reorganization on a basis then supposed most desirable and efficient. Further editorial comment on this subject will be made in a subsequent issue of the JOURNAL.

MEDICAL NOTES.

HAVERHILL INSTITUTIONS BENEFIT.—By the will of Mary N. Martin of 60 The Fenway, Hale Hospital and the Old Ladies' Home Association, both of Haverhill, will each receive \$1000. Other bequests are made and the residue is given to the New England Home for Crippled Children.

WILL OF DR. WILLIAM P. BOLLES.—Many public bequests are contained in the will of the late Dr. William P. Bolles of Roxbury, who died in California in March. The New England Genealogical Society is given all the genealogical books and papers; the Boston City Hospital gets all the medical books; Dr. Wilfred T. Grenfell, superintendent of the Labrador Mission, all surgical instruments and apparatus, and the Connecticut College for Women at New London, the general library of Dr. Bolles, and scientific apparatus, such as microscopes, telescopes, photographic cameras and lenses, drawing instruments, etc.

WOMAN'S MEDICAL COLLEGE FELLOWSHIP.—The Woman's Medical College of Pennsylvania has established a fellowship amounting to \$1000, to be awarded annually to any medical woman of special ability who, following the undergraduate course, has completed at least one year of hospital service, including work in maternity wards, and one year of further practice. The amount is to cover twelve months of special work as Fellow in Obstetrics, with the condition that the holder of the fellowship shall thereafter continue the practice of obstetrics.

LONDON DEATH RATES IN 1915.—Statistics recently published show that during the year 1915, the total death rate of London was only 16.1 per thousand inhabitants living. Among the several districts and boroughs the highest yearly death rate was 20.2 in Bermondsey, a populous southern slum, and the lowest was 12.4 at Lewisham, a more open southern suburb.

DISBURSEMENTS OF ROCKEFELLER FOUNDATION.—Report from New York on April 6 states that the disbursements of the Rockefeller Foundation for the year 1915 were announced as follows on

that date: The total of funds distributed by the Rockefeller Foundation during 1915 was \$3,643,000, of which \$582,339 was for war relief. The international health commission and the China medical board received respectively \$441,301 and \$157,623. For scientific study of problems in government the foundation contributed \$50,000.

Included in the war relief distributions were these items: Belgian food supply, \$2839; Belgian relief work in Holland, \$78,410; Belgian University professors, \$20,000; commission for relief in Belgium, \$200,000; Serbian sanitation and relief, \$104,332; Persian relief, \$30,000; Armenian relief, \$40,000; international committee, Y. M. C. A., \$25,000; Rockefeller Institute for Medical Research, \$25,000; advanced for war relief, but not expended, \$25,000.

PROPOSED UNION OF PHILADELPHIA MEDICAL SCHOOLS.—Report from Philadelphia states that on April 7 Dr. William Pepper, dean of the University of Pennsylvania Medical School, announced that a plan had been proposed for the union of that school with the Jefferson Medical School and the Philadelphia Medico-Chirurgical College. Details of this project, or the possibility of its fulfillment are still uncertain.

PSYCHOPATHIC HOSPITAL IN NEW YORK.—It is announced that an anonymous donor has offered to give the sum of \$500,000 towards the establishment of a Psychopathic Institution in New York, provided such an institution be established by the passage of the Wheeler Bill now pending before the General Assembly at Albany. This proposed bill provides for the creation of a commission of seven to supervise the work of examining and diagnosing cases of mental deficiency under observation at a new psychopathic institution.

STATE PUBLIC HEALTH WORK.—The Council on Health and Public Instruction of the American Medical Association has recently published an extensive report of state public health work, based on a survey of state boards of health, compiled by Charles V. Chapin, commissioner of health, of Providence, R. I. The council states its purpose in making this report to be as follows:

"The publication and distribution of this report completes the first effort that has been made to carry on a comprehensive and comparative survey of the public health work of the various states and to undertake some kind of comparative rating of the work being done in the different states. The object of the Council in undertaking such a task is not in any sense due to a desire to be either critical or dictatorial, but rather to present in tabulated form the essential facts regarding state public health work as viewed by a recognized expert on this subject. It is hoped that the discussions of state public

health work and the comparative tables will be of service to state boards of health in presenting to governors, legislators and legislative committees a clear statement of the facts regarding public health work in each state; that the rating sheet may be of value in pointing out the weak points in each state, by the strengthening of which the relative standing of the state may be raised; and that the collection and publication of the facts contained in the report may be of some service in increasing the effectiveness of state public health work."

The volume opens with a survey of public health work. Then follow summaries of the conditions in each state. Under the heading of the states is arranged a discussion of the organization of the department of health, of the powers of the executive heads, local health administration and the state management of communicable diseases, the keeping of vital statistics, child hygiene, public health education, food, engineering, and miscellaneous duties. The book ends with a financial statement, ratings of the states, and various tables of epitomized facts.

DISCOVERY OF A NEW SERUM.—Report from Paris on April 4 states that on April 3 Dr. Pierre Roux, director of the Pasteur Institute, announced before the Academy of Sciences the discovery of a serum for the treatment and prevention of a so-called eruptive typhus. The discovery is said to have been made as a result of the researches of Dr. Nicole, director of the Pasteur Institute at Tunis, where the disease is prevalent.

CHILD BEARING AND THE STATE LABOR LAW.—Some time ago it was suggested that the New York Board of Health adopt suitable regulations prohibiting the industrial employment of women immediately before and after childbirth, the opinion being expressed that this was an important cause of ill health. Since such a regulation is already part of the state factory law, a survey was conducted to determine whether any additional legislation was necessary and to what extent, if any, the present factory regulation is being violated. The study was made in Health District No. 2 and embraced the mothers of babies under one year of age. Altogether 750 such mothers were counted and of these only three went to work in a factory, two, four, and six months respectively after confinement. It must, of course, be borne in mind that this relates almost entirely to Yiddish mothers in one small part of the city; possibly a city-wide census would disclose other conditions. In this connection, it may be pointed out that the high mortality among negro mothers in New York City has been laid to the early return to work on the part of these.

EUROPEAN WAR NOTES.

PLAN HOSPITAL TO RESTORE WAR RUINED FACES.—A committee of prominent Boston surgeons and dentists, of which Dr. Charles M. Proctor is chairman, has issued an appeal for funds to establish a special American hospital in Paris for wounds of the face and jaw. Already the greatest facial surgeons in the world have offered their services, the French war office has agreed to put a suitable building at their disposal, and the American Red Cross will furnish supplies. Because of the character of trench warfare, the number of face wounds in this war has been proportionately greater than in any other war, and the facilities for treating them have been entirely inadequate. So great has been the demand for hospital space that there has been no time and no place for any treatment except to prevent infection, and the delicate rebuilding work has had to be practically neglected.

In asking for funds the committee says that \$20,000 will establish and maintain 100 beds and make a great work possible. The committee desires, however, to equip the hospital with 500 beds. The appeal says: "The work of this special American hospital is to restore as nearly as possible the facial contour, thus enabling these horribly mutilated men, who in their present condition are extremely repulsive, to mingle with their fellow-men and earn a livelihood." The dental profession of America is responsible for the undertaking. Subscriptions amounting to \$1765.00 have already been received. N. Penrose Halliwell, 44 State St., Boston, is the treasurer.

MEDICAL WORK IN BELGIUM.—Dr. William Palmer Lucas, Professor of Pediatrics at the University of California, has been asked by Mr. C. H. Hoover to go to Belgium for relief work in connection with the infants' and children's dietetic problems which have arisen there. Dr. Lucas sailed on the *Philadelphia* on April 22, and expects to be away for at least three months.

WAR RELIEF FUNDS.—On April 30 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	\$115,333.20
Serbian Fund	90,723.78
Allied Fund	87,386.36
French Wounded Fund	74,413.34
British Imperial Fund	53,963.31
French Orphanage Fund	40,670.07
Armenian Fund	37,727.03
Polish Fund	30,210.71
Surgical Dressings Fund	23,894.17
LaFayette Fund	20,063.53
Italian Fund	17,108.56
P. S. D. Fund	8,295.83

Cardinal Mercier Fund	5,334.00
Facial Hospital Fund	5,278.00
Brittany Hospitals Fund	2,792.50
Belgian Tobacco Fund	1,488.93
Allies' Tobacco Fund	1,283.50
French Musicians' Fund	290.80

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending April 29, 1916, there were 265 deaths reported, with a rate of 18.17 per 1,000 population, as compared with 254 and a rate of 17.70 for the corresponding week of last year. There were 29 deaths under 1 year, as compared with 48 last year, and 100 deaths over 60 years of age against 76 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 47; scarlet fever, 60; measles, 260; whooping cough, 19; typhoid fever, 5; tuberculosis, 42.

Included in the above were the following cases of non-residents: Diphtheria, 5; scarlet fever, 17; measles, 1.

Total deaths from these diseases were: Diphtheria, 6; scarlet fever, 2; whooping cough, 1; tuberculosis, 24.

Included in the above were the following deaths of non-residents: Tuberculosis, 2.

HUNTINGTON HOSPITAL FOR CANCER RESEARCH.

—The third annual report of the Collis P. Huntington Memorial Hospital for Cancer Research and of the Laboratories of the Cancer Commission of Harvard University, records the work of these institutions for the year ended June 30, 1915. The consulting surgeon, Dr. Robert B. Greenough, summarizes the results of the year by stating that radium offers a method of treatment of cancer cases, probably curative in certain superficial lesions and of marked palliative benefit in more advanced and deeper conditions. He further states that the development of x-rays in the treatment of cancer is greatly needed and facilities for the investigation of x-ray therapy are greatly to be desired at the hospital. The number of patients treated at the hospital increased rapidly. There were in all 509 patients treated in the house and out-patient departments as against 313 the year before, an increase of 62%. There were 5725 in-patient days and 3676 out-patient visits in 1914-1915.

THE BOSTON LYING-IN HOSPITAL.—The recently issued annual report of the Boston Lying-in Hospital records the work of the 83rd year of that institution, and covers the period from Jan. 1, 1915 to Dec. 31, 1915. It states that fourteen per cent., or one-seventh of the babies born in Boston last year were born to patients of this Hospital, and emphasizes the great need of larger quarters to carry on the ever increasing

amount of service that the Hospital is able to do each succeeding year. Only the poorer classes of patients who can be received in wards can now be provided for by the Hospital, but the need of private rooms for the use of patients in better circumstances is great. Mention has at various times been made in this JOURNAL of the efforts of the Trustees to increase the present fund for the building of a new hospital. The report states that about \$195,000 more is needed before operations can begin. In the Hospital 924 patients (mothers) have been cared for and 897 babies born. The out-patient departments have attended 1932 mothers and 1960 babies have been born. The pregnancy clinics have treated 628 patients before admission to the Hospital and 1187 before admission to the out-patient department.

A NEW HARVARD UNIT.—The next Harvard Unit to take service with the British Expeditionary Force in France will be in charge of Dr. Hugh Cabot. There is special need for recent graduates of Harvard who have had some training in surgery; applications may be sent to Dr. Hugh Cabot, 87 Marlborough St., Boston. The term of service is six months, and the Unit expects to sail about the middle of May.

Obituary.

DAVID CHOATE, M.D.

DR. DAVID CHOATE of Salem died at his home April 23, 1916, aged 87 years. He was born in Essex, Nov. 27, 1828, and was a nephew of Rufus Choate and a second cousin of Joseph H. Choate. Graduating from the Harvard Medical School in 1854 in the same class with Samuel A. Green, he settled in Topsfield, where he practised for three years before making his permanent residence in Salem. During the Civil War, he was examining surgeon for volunteers and drafted men, and examiner for pensions from 1863 to 1869. He was physician on the staff of the Salem Hospital from 1873 to 1887, and was at one time city physician and a member of the school board. He joined the Massachusetts Medical Society in 1854 and was a member of the Essex South District Medical Society, his name being placed on the retired list in 1889.

Dr. Choate was for years a deacon in the Tabernacle Congregational Church, was a noted Bible student and a contributor to religious publications. His wife, who was Susan Temple of Ipswich, died ten years ago, and he is survived by one daughter and two brothers.

Miscellany.

NOTICES.

EXAMINATION OF CANDIDATES FOR ASSISTANT SURGEON.—Treasury Department, United States Public Health Service.—Boards will be convened at the Bureau of Public Health Service, 3 "B" Street, S. E., Washington, D. C., and at a number of the Marine Hospitals of the Service, on Wednesday, May 31, 1916, at 10 o'clock a.m., for the purpose of examining candidates for admission to the grade of Assistant Surgeon in the Public Health Service.

The candidate must be between 23 and 32 years of age, a graduate of a reputable medical college, and must furnish testimonials from two responsible persons as to his professional and moral character, together with a recent photograph of himself. Credit will be given in the examination for service in hospitals for the insane, experience in the detection of mental diseases, and in any other particular line of professional work. Candidates must have had one year's hospital experience or two years' professional work.

For invitation to appear before the board of examiners, address "Surgeon-General, Public Health Service, Washington, D. C."

EXAMINATION OF CANDIDATES FOR UNITED STATES NAVY MEDICAL CORPS.—The next examination for admission into the Medical Corps of the Navy will be held on or about June 16, 1916, at Washington, D. C., Boston, Mass., New York, N. Y., Philadelphia, Pa., Norfolk, Va., Charleston, S. C., Great Lakes (Chicago), Ill., Mare Island, Cal., and Puget Sound, Wash.

The applicant must be a citizen of the United States, between 21 and 30 years of age, a graduate of a reputable school of medicine, and must apply for permission to appear before a Board of Medical Examiners. The application must be in the handwriting of the applicant, and must be accompanied by the following certificates:

a. Letters or certificates from two or more persons of good repute, testifying from personal knowledge to good habits and moral character.

b. A certificate to the effect that the applicant is a citizen of the United States.

c. Certificate of preliminary education: The candidate must submit a certificate of graduation from an accepted high school or an acceptable equivalent.

d. Certificates of medical education: This certificate should give the name of the school and the date of graduation.

e. If the candidate has had hospital service or special educational or professional advantages, certificates to this effect, signed by the proper authorities, should also be forwarded.

Application should reach the Bureau of Medicine and Surgery not later than June 5, 1916.

Successful candidates are appointed Assistant Surgeons in the Medical Reserve Corps, and if so recommended are subsequently assigned to duty, with full pay and allowances, in attendance upon a course of instruction at the Naval Medical School, Washington, D. C. This course begins annually about October first and lasts about six months. Upon the completion thereof, the student officers are given their final examination, and, if found qualified, are commissioned as Assistant-Surgeons in the regular Medical Corps of the Navy.

Assistant surgeons are examined for promotion at the expiration of three years' service, and, if successful, become passed assistant surgeons. Promotions to the higher grades are made in the order of seniority to fill vacancies as they are created (by resignation, retirement, or death), and for each promotion a physical and professional examination is required by law.

The pay of an assistant surgeon is \$2000.00 per

year on shore duty, and \$2200.00 at sea. At the expiration of the three years mentioned in the preceding paragraph, if successful in passing the examination for the rank of passed assistant surgeon, pay on shore is \$2400.00; at sea, \$2640.00. After a total of five years in the service, pay on shore is \$2640.00; at sea, \$2904.00. Both at sea and on shore, quarters or their equivalent are provided; if these are not available on shore duty, an ample, appropriate allowance is provided for rental, heat and light of same. An allowance of eight cents a mile is also provided when traveling on orders.

Full information with regard to physical and professional examinations, with instructions how to submit formal application, may be obtained by addressing the Surgeon General of the Navy, Navy Department, Washington, D. C.

NOTICE OF A COMPETITIVE EXAMINATION FOR QUALIFICATION ON THE ELIGIBLE LIST OF CANDIDATES FOR POSITIONS AS STATE DISTRICT HEALTH OFFICERS IN THE MASSACHUSETTS STATE DEPARTMENT OF HEALTH.—Although the law leaves the appointment of District Health Officers in the hands of the Commissioner of Health, it is the policy of the State Department of Health to hold competitive examinations for this position and to consider the results of such examinations as the principal basis for selecting appointees.

On May 25 and 26, 1916, and on subsequent dates to be announced at that time, an examination will be held for the purpose of establishing an eligible list of appointments to positions as State District Health Officers of the Massachusetts State Department of Health.

The written examination will be held on the above dates in the examination room of the Civil Service Commission, No. 15, State House, Boston. The oral and practical examinations will be held on dates and at places announced at the time of the written examination.

There will be at least two appointments to be made from this eligible list in the near future. The eligible list established on the results of this examination will hold for at least one year.

Persons possessing the necessary qualifications and desiring to enter the competitive examination of this service are requested to communicate with the State Commissioner of Health, State House, Boston, at once. Upon such written application, a list of rules and regulations governing the appointment and promotion of District Health Officers and an application blank will be sent.

Admission to the examination is governed by the regulations accompanying this notice. Physical fitness is a necessary prerequisite, but no percentage credits are given on physique. The examination comprises written, oral and, if feasible, practical tests.

Relative rating on the eligible list is established on the basis of:

a. Previous experience in public health work, both administrative and scientific—maximum 20 points.

b. Results of oral examination—maximum 20 points.

c. Results of written examination—maximum 60 points.

A. J. McLAUGHLIN,
Commissioner of Health.

April 12, 1916.

STATE DEPARTMENT OF HEALTH OF MASSACHUSETTS

Regulations Governing Appointment of State District Health Officers.

1. Grades of District Health Officers.—There shall be four grades of District Health Officers, viz: A, B, C, and D.

2. District Health Officers appointed only to Grade D.—Candidates for the position of District

Health Officer, after passing a successful examination, shall be eligible for appointment to Grade D.

3. Form of application for appointment.—Candidates for the position of District Health Officer must make application addressed to the Commissioner of Health in their own handwriting, asking permission to appear before a Board of Examiners. Candidates shall state their age, date and place of birth, present legal residence, names of colleges or institutions of learning of which they are graduates, date of graduation, and shall furnish testimonials as to their professional experience and moral character.

4. Age Limit.—No candidate will be eligible to appear before a Board of Examiners whose age is less than twenty-three years or more than forty years. Candidates over thirty-five must have had at least three years' practical experience in public health work.

5. Professional Requirements.—Candidates shall be graduates of an incorporated medical school or shall have had at least five years' experience in public health work and sanitary science.

6. Citizenship.—All candidates must be citizens of the United States, and preference in appointment shall be given to residents of Massachusetts.

7. Physical Examination.—Candidates for appointment must pass a satisfactory physical examination before a Board of Examiners.

8. Board of Examiners.—The Board of Examiners shall consist of three or more members. These members shall be selected by the Commissioner of Health from the Public Health Council or other officials of the State Department of Health.

9. Scope of Examination.—All examinations of candidates for appointment as District Health Officer shall be conducted by a Board of Examiners and the examination shall include a physical examination and such oral, written and practical tests as the Board deems necessary in the subjects outlined in the succeeding sections. Experience and fitness shall also be rated by the Board of Examiners.

10. Subject for written examination.—All candidates for appointment must pass a satisfactory written examination in Communicable Diseases, Hygiene and Sanitation, Preventive Medicine, Vital Statistics, Pathology and Bacteriology.

11. Compensation.—The compensation of District Health Officers shall be as follows: Grade A, \$3500; Grade B, \$3000; Grade C, \$2500; Grade D, \$2000.

12. When promoted.—After six months' satisfactory service in Grade D, a District Health Officer is entitled to promotion to Grade C. After three years' satisfactory service in Grade C, a District Health Officer is entitled to examination for promotion to Grade B. After five years' satisfactory service in Grade B, a District Health Officer is entitled to examination for promotion to Grade A.

13. Examinations for promotion.—Examinations for promotion shall be conducted by a Board of Examiners, who shall take into account the efficiency record of the candidate as well as his professional and physical fitness. Failing first examination a District Health Officer may be given a second examination after one year. Failing two successive examinations, such a District Health Officer shall be dropped from the rolls.

14. Tenure of Office.—A District Health Officer may be removed from office by the Commissioner of Health because of failure to pass two successive examinations for promotion, or because of gross misconduct or inefficiency, but only after the accused officer has been furnished with a copy of the charges made against him and given a hearing thereon by the Public Health Council.

SOCIETY NOTICES.

MASSACHUSETTS GENERAL HOSPITAL.—A meeting of the Massachusetts General Hospital Clinical Society will be held Monday, May 8, at 7.30 P.M., in the Out-Patient Building Amphitheatre. Meetings are discontinued after this date until next fall.

SUBJECTS.

1. Demonstration of Cases.
2. "Chronic Inflammatory Disease of the Thyroid Gland," Dr. John S. Hodgson.
3. "The Etiology of Sterility," Dr. A. W. Reggio.
4. "The Control of Strychnia Convulsions by Intraspinal Injections of Magnesium Sulphate," Dr. B. H. Alton and Dr. Elliott C. Cutler.

The administrative and visiting staffs, physicians, surgeons and students are cordially invited.

ELLIOTT C. CUTLER, M.D., *Secretary*.

NORFOLK DISTRICT MEDICAL SOCIETY.—The sixty-sixth annual meeting will be held at the New American House, Boston, Tuesday, May 9. A business meeting will be held at 5.30 P.M. The will consist of the reading of the minutes of the previous meeting, report of committees, report of treasurer, election of officers and incidental business. At 6.30 dinner will be served. The entertainment committee will present a short play followed by a farce.

The Board of Censors will meet for the examination of candidates on Thursday, May 11, at 2 P.M., at the Roxbury Masonic Temple, 171 Warren Street, Roxbury.

The Treasurer will be at the meeting ready to receive the Annual Assessment of \$5.00. All members are urgently requested to pay at that time, or to forward the amount to him, instead of making payments at the meeting of the Massachusetts Medical Society in June.

BRADFORD KENT, M.D., *Secretary*.

798 Blue Hill Avenue, Dorchester.

RECENT DEATHS.

DR. CHARLES SINCLAIR STONE, a Fellow of the Massachusetts Medical Society, died at his home, 752 Tremont Street, April 22, aged 56 years. He was a graduate of the Harvard Medical School in the class of 1886, and had lived and practised in the same house for many years.

DR. J. WILLIAM WHITE of Philadelphia died of pneumonia on April 24, at the age of 66. He was a trustee of the University of Pennsylvania and well known as a surgeon and author.

DR. JOHN A. L. VON BETZEN, who died on April 23, at Battle Creek, Mich., had practiced dentistry in Boston for the past fifteen years. He was 47 years of age.

DR. GEORGE W. DERRICK, Health Officer of Norwood, and member of the Board of Health, died April 23 at the Brooks Hospital, Brookline. Dr. Derrick's hand was slightly injured by a needle point a week ago and blood poisoning followed. Dr. Derrick was born in Watch View, Conn., and was 38 years old. He was graduated from Tufts College in 1897 and from Tufts Medical School in 1901. He was a physician at the Rutland Sanitarium for some years. Dr. Derrick took a deep interest in athletics for boys and gave much assistance to the local high school teams.

DR. CHARLES R. DICKERMAN, who died on April 7 at Taunton, Mass., the son of a practicing dentist in that city, had been a dental practitioner in his office for many years. He is survived by his widow, two daughters and two sons.